CRANFIELD UNIVERSITY

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THE VALUE PROPOSITION IN INTERNATIONAL FREIGHT: THE CONTRIBUTION OF THE FREIGHT FORWARDER TO THE GLOBAL LOGISTICS TRIAD

SCHOOL OF MANAGEMENT

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Supervisor: Dr. Derek Wright

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ABSTRACT

The freight forwarder has been threatened with 'disintermediation' for years. This research looks at the relationships in the global logistics triad comprising the forwarder, the shipper, and the airline or ocean carrier. The middle-man in service industries such as freight forwarding performs the service of intermediation. He is defined as one who reduces or eliminates the need for a buyer to form exchange relationships, ad hoc or relational, with a number of suppliers by concentrating the buyer's need for information at the buyer interface and expanding the buyer's requirement for choice or selection at the supplier interface.

This vendor contraction and expansion are explored in the qualitative first phase of the research which examines the relationships, shared functions, and roles of the members of the global logistics triad as well as the contribution of the freight forwarder. Modal differences are prominent. Shippers are closer in a relational sense to ocean carriers than to airlines – the exporter is much more likely to use a shipping line directly than to use an airline. This modal difference owes much to the airfreight industry's origins in passenger transportation. It is reflected in the airlines' perspective of the forwarder: as customer because of forwarders' purchase of space, as competitor because the airline is being excluded from dealing directly with the shipper, and as collaborator because of the common threat of the integrator. To the ocean carrier, the forwarder is customer and competitor only – collaboration is rare.

Factors that affect the customer/competitor/collaborator trichotomy in airfreight include freight capacity, the level of forwarder commitment to space, the status freight has with the airline, and the makeup of the airline's customer portfolio. The factors that affect the customer/ competitor dichotomy in ocean freight include the extent of LCL (Less than Container Load) cargo and 3PL (3rd Party Logistics) services offered by the shipping line.

The modal differences and complexities inherent in the global airfreight triad were explored in the subsequent quantitative phase. What value does the airfreight forwarder offer to the shipper that would compel him to not disintermediate this intermediary and deal directly with the airline? It is surmised the forwarder offers value through cost reduction, specifically the costs of transacting with a number of airlines.

This second phase is based on Transaction Cost Analysis using an experiment-derived survey instrument. The transaction costs of searching for vendors, developing relationships with them, monitoring their performance, handling problems that may arise, and managing potential opportunistic behaviour were examined. The shipper-respondents – made up of British global exporters who used airfreight – were asked to compare their perception of these costs for the forwarder and for the airline. They were also asked about production cost/price advantages as well as demographic information that was presumed to affect these perceptions.

The differences between these perceptions of transaction costs were highly significant with the perception of offering lower transaction costs, and hence greater value, lying with the forwarder. The shippers also positively viewed forwarders regarding the production cost/price advantages. However, the demographic variables played little part in the shippers' differential perceptions of transaction costs.

Contribution is made to Transaction Cost Theory by suggesting the inclusion of triadic relationships and the intermediary as a governance alternative. In addition, the freight forwarding industry and global distribution benefit. Finally, at the level of method, the TC comparison technique used offers a fresh approach to comparing primary and intermediary vendors.

ACKNOWLEDGEMENTS

Normally one begins by thanking those people academically involved in the research – colleagues, supervisors, and sponsors – and then spiralling out to encompass those individuals in one's personal life who helped the writer. These same groups of people made life easier for me as well. But because of the years spent criss-crossing the Atlantic I have decided to offer my appreciation on a more geographic basis.

Starting with Britain, my heartfelt thanks go to several colleagues who offered advice and read sections of the thesis: Gilles Spony and Val Singh – and I'm only sorry I didn't finish the same year as them! Many thanks go to other colleagues at Cranfield such as Ian Black, Martin Christopher, Mark Barratt, Adegoke Oke, Colin Pilbeam, and Barbara Birtles. Apart from Cranfield, I must thank my interviewees, Paul Jackson of Triangle Management, and a certain unnamed freight forwarder for their invaluable contribution.

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For my parents, thanks for the focus on life-long learning and in answer to my Mother: 'Yes, it's finished!' Naturally, I will end by thanking my wife and daughters. Over all the years (and both girls were born during this little sojourn into academia) you have put up with my idiosyncrasies and made it easier for me to concentrate on my work. That means a lot to me. I love you all.

Richard Ford

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Chapter 1: INTRODUCTION

1.1 An overview of the research

Freight forwarders have been said to have operated under a sword of Damocles[1] for decades (White, 1988). Many times their demise has been predicted and yet forwarders, especially in airfreight, are still used by a large proportion of shippers. What value does the freight forwarder offer the shipper that may explain their continued existence? Why do shippers continue to purchase airfreight through intermediaries such as forwarders rather than dealing directly with the air carriers?

Adopting a UK perspective where possible the first chapters of this thesis will explore global freight services and the various participants involved, the exchange relationships that exist between these participants, and the position of the intermediary in these transactions. This exploration converges on the research questions and the boundary of the researchable area. Subsequent sections will build on the understanding of the exchange relationships in this triad in order to show how the intermediary adds value chiefly through cost reduction. By reducing the buyer's costs of transacting with the seller and, in addition, offering certain production cost or price advantages of its own the intermediary reduces the perceived *total* costs of the buyer. The use of Transaction cost analysis (TCA) will aid in the study of the intermediary as value creator.

Value is a measure of the prospective buyer's desire for something. Enhancing or creating value in the eyes of this buyer is, or should be, a major intention of all firms. How does the intermediary contribute value and, indeed, what makes up this value contribution? And who is the beneficiary of this contribution? The value proposition that leads to this

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[1] Damocles was a courtier in ancient Syracuse. According to legend, he was seated at a banquet beneath a sword suspended by a single hair. The sword of Damocles, therefore, has come to represent any imminent disaster.

contribution becomes one of cost-reduction: both explicit costs usually reflected in a lower price and administration and co-ordination costs commonly referred to as transaction costs. Therefore, from the shipper/ buyer's point of view, the intermediary contributes to this value contribution by reducing his costs of doing business.

In addition to the buyer, the intermediary may also offer some degree of value up the distribution channel to the prime seller. In international freight, the intermediating function of the forwarder may lower the costs for the carrier as well. With airfreight, the forwarder may assume the role of a marketing and retailing wing for the airline as well as a competitive façade to those shippers considering using an integrator.

Intermediaries in international freight will be discussed more fully later. As the earliest of the global intermediaries and still the most-widely used, the focus of this work is on the freight forwarder. The delineation amongst third party logistics (3PL) providers such as freight forwarders has become vague. As will be noted, modern third party logistics providers are often defined by their origins rather than by their current offering.

Freight forwarders are best known for their work in the international arena. While "domestic freight forwarding" does exist it is beyond the scope of this work. International freight transport, with all its distances, varying transport modes, trade regulations, languages, and country specific laws is a complex environment. The perplexity this poses to shippers may be one reason for the forwarder's existence.

1.2 Arguing for the proposal: The justification for the research

At the personal level the author's background in the forwarding industry has led to questioning what freight forwarders actually did for their customers that they couldn't do for themselves. Why is the buyer willing to pay for a freight forwarder and what does he get for it? How do forwarders put a value on their services? Because the average freight forwarder, at least in North America, employs less than fifty people the resources normally do not exist to discover these answers (Murphy & Daley, 1996b). These small and medium sized companies are being forced into specialised niches by larger competitors (White, 1988; Hewison, 1991; Turney, 1997). Never a highly profitable industry, freight forwarders are finding themselves needing to invest in expensive information systems while prices for their services are being driven down (Jansen, 1990).

At the corporate level, as an industry, freight forwarding employs between eight and ten million people world-wide (Davies & Gray, 1985; Eller, 1995). Its importance to the global transport infrastructure is such that, even recently, half of ocean freight and most of airfreight was moved globally through freight forwarders (Davies, 1984; Murphy, Daley, & Dalenberg, 1991b; Anderson, 1993). And yet, very little empirical research has been carried out with the freight forwarder as the focus. With disintermediation - the elimination of the middleman - a much discussed possibility in service channels, there is a need for research asking why the middleman exists and what value he offers (White, 1988; Jock, 1995; Harrington & Reed, 1996; Picot, Bortenlanger, & Rohrl, 1997).

Much of this literature on disintermediation is based on the electronic elimination of intermediaries because of the potential contraction of the supply chain brought on by information networks such as the Internet (Benjamin & Wigand, 1995; Wigand & Benjamin, 1995; Jock, 1995; Sarkar, Butler, & Steinfield, 1995; Steinfield, Kraut, & Plummer, 1995).

However, some researchers in electronic commerce believe that the middleman may survive in a new electronic age either by creating new value in the chain or through economies of scale, a process described as reintermediation (Wigand, 1997; Tapscott, 1996).

The prevalent view of modern business thinking has become that of a lean and agile supply chain with non-value adding functions eliminated. Current information systems that allow parties in this new supply chain to connect and communicate more easily have removed much of the complexity in global logistics. And yet the freight forwarder continues to co-exist with new third party players in global logistics such as the integrator.

1.3 Research contribution

Most academic research that focuses directly on the freight forwarder has been descriptive in nature and on the substantive level. Shifting this to the abstract level has rarely occurred. This is needed in order to generalise results across similar service industries in which intermediaries exist, such as travel agencies. In this area there is a need for empirical research that explains and possibly, rationalises the existence of freight forwarders and similar intermediaries in service-based industries.

Supply networks are shrinking by cutting out the layers between the extremes of ultimate customer and primary vendor (White, 1988; Cooper & Ellram, 1993; Harland, 1996). The complex web of links and nodes is becoming thinner as participants are culled. The driving forces are sometimes cost reduction or seeking a bigger piece of the network's profit margin pie. The trend towards dealing with fewer suppliers is perhaps derived from doing away with non-value-added activities and reducing the time and effort of administration (Porter, 1980). This elimination of layers or nodes can draw the remaining participants closer to each other.

Sharing of information via complex interorganisational information systems (IOS) often enhances the formation of these partnerships (Wright, 1996).

Similarly, buyers of logistics services are moving away from transactional, ad hoc exchanges towards contractual, long-term relationships (LaLonde, Cooper, & Noordewier, 1988; Bowersox, 1990; LaLonde & Masters, 1990; Browne, 1992). Schary and Coakley have suggested that those forces that shape logistics management within organisations are either centripetal or centrifugal: centripetal because of the grouping of functional activities into a single organisational unit and centrifugal because of the outsourcing to third parties or divestment of those functional activities which do not form part of the core business of the company (Schary & Coakley, 1991). Porter has provided three generic strategies based on low cost (and, therefore, usually a low price), differentiation, and a focus on customer relationships (Porter, 1980). Those firms that don't have a value or cost advantage should outsource those functions to firms that do (Peck, Payne, Christopher, & Clarke; 1998).

In domestic logistics, the trend appears to be towards these longer-term relationships and away from traditional, adversarial exchange transactions (LaLonde, Cooper, & Noordewier; 1988; Aertsen, 1993). Likewise in global logistics, the shipper/carrier relationship is becoming longer-term and more contractual (Day, 1991; Wood, Barone, Murphy, & Wardlow, 1995).

Therefore, there is a trend towards stronger partnerships with fewer numbers of suppliers in supply networks as well as in logistics buyer/seller relationships and the global subset. This trend leads to a more direct path between ultimate customer and primary vendor and the "disintermediation" of those participants in the middle. Yet the freight forwarder, as the major intermediary in global freight, appears to defy these trends. What is it about global freight that seems to invite the intervention of the freight

forwarder? Should one consider the triadic relationship between buyer-shipper, intermediary-forwarder, and seller-carrier in global freight in the same way as the dyadic relationship between buyer-shipper and seller-carrier in domestic freight? What is it about the buyer/seller relationships in global freight that encourages the participation of the intermediary?

The decisive factor appears to be the contribution of value to the supply network (Beier, 1989). If a logistics intermediary - domestic or global - adds value to the buyer's side he may be able to maintain his position in the supply network. In this context, value contribution or creation primarily implies reducing costs to the buyer, whether these are direct costs as in reduced logistics costs or indirect costs as in reduced administration costs.

In addition, it has been suggested that global logistics, as a concept, has not been viewed holistically. Value creation in place of or in addition to cost reduction has been applied to individual segments, rather than to the whole network (Herron, 1988; Davies, 1990). This piecemeal approach negates the total cost advantages of viewing the network strategically. Buyers of global freight services may not consider the international transport function within the context of total logistics costs.

Therefore, at the substantive level there exists a gap in our knowledge about the position of the freight forwarder in the global supply chain, his relationships with his supply chain partners, and the value he contributes. Similarly, at the abstract level there is a need for more empirical research on the value contributed by the service intermediary and the rationale for his existence. Empirical research focusing on the freight forwarder as the intermediary in international freight transport would raise our knowledge of global supply chains and give meaning to the position of the intermediary in service channels in general.

1.4 The initial research questions

The initial research questions became those questioning this buyer/seller relationship and the position and role of the intermediary in global freight transport:

1. Can one consider the triadic relationship in global freight in the same way as the dyadic relationship of buyer and seller in domestic freight?
2. How does the buyer/seller relationship in global freight encourage the participation of the intermediary?

Based on the premise that value creation by the service intermediary comes about primarily through cost reduction, the operational questions become:

1. What role or roles does the freight forwarder play in global freight?
2. What influences the relationships between exporters, freight forwarders, and carriers?
3. Why do some exporters choose to buy the mediating function performed by freight forwarders while others keep it in-house by dealing directly with carriers?
4. What is the exporter's perception of transportation costs in global freight?
5. Is a perceived reduction in the exporter's total transportation costs linked to increased outsourcing of the mediating function?

1.5 Outline of thesis chapters

Through an examination of the literature, the following chapters in this thesis will examine the primary areas of global logistics, exchange relationships and social networks, and the intermediary. This examination will then focus on the secondary areas or overlaps of the primary areas

before converging on the nucleus which relates directly to the research questions. Subsequent chapters review the philosophical motivators for the research and introduce the varied methods used to derive and test the theory. These methods are further developed in succeeding chapters followed by their application and analyses culminating with interpretation and generalisation.

Chapter 2: THE RATIONALE – A REVIEW OF THE LITERATURE

2.1 Introduction: Mapping the field

The following figure presents a schematic for analysing and presenting the literature (Jenkins, 1997). The primary literature fields studied are global logistics services, exchange relationships and social networks, and intermediaries. The overlaps between these three primary fields form the secondary fields. The breadth of the primary literature fields necessitates moving to these narrower, more sharply defined secondary areas. The overlap between global logistics services and exchange relationships is global channel relationships and supply chains; between global logistics services and intermediaries is the global third party logistics provider; and the overlap between exchange relationships and intermediaries is governance and the market/hierarchy continuum. This inward spiral path through the literature leads to a common point upon which the literature fields pivot - that of internalisation and intermediary value in global freight.

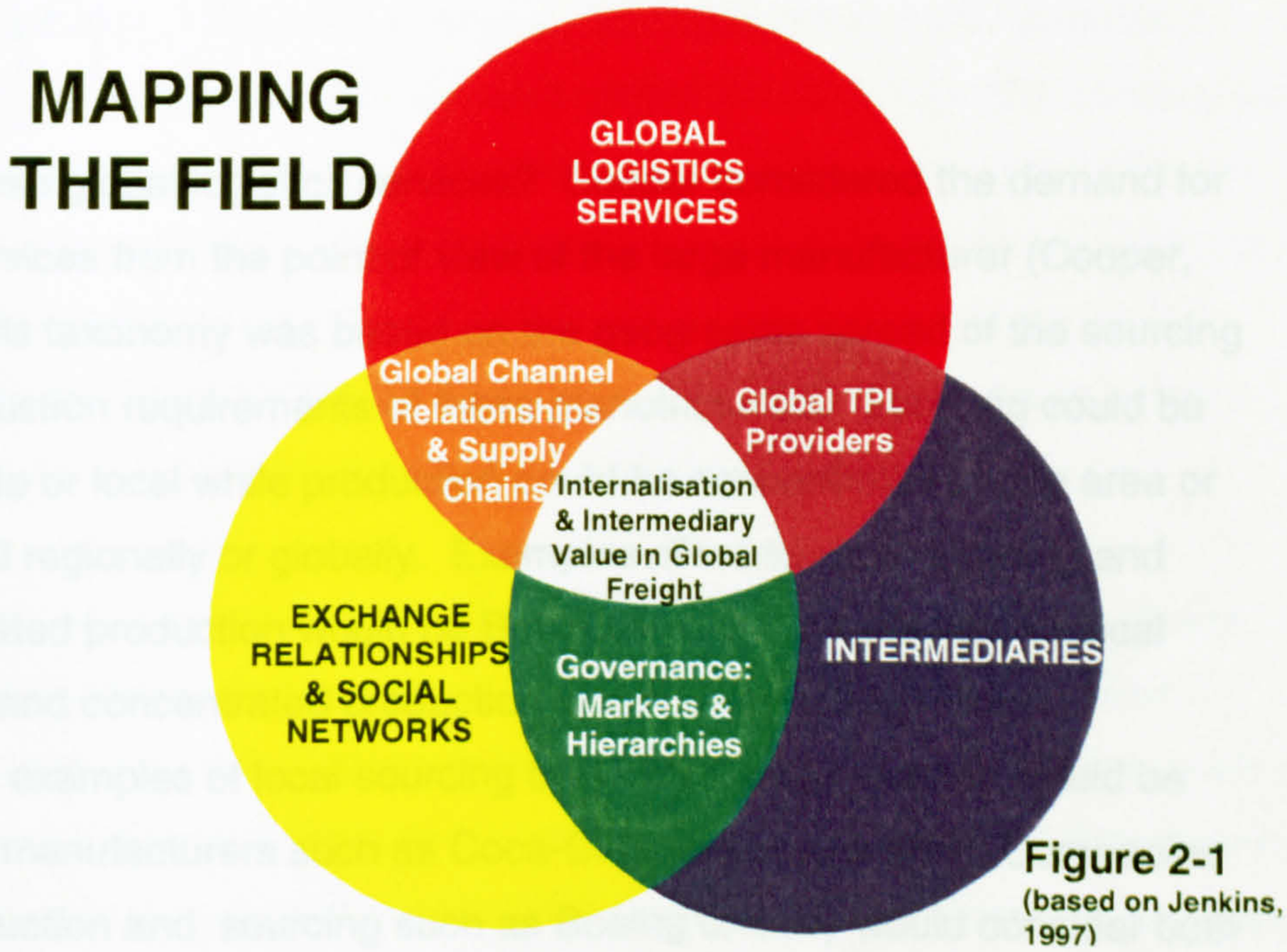
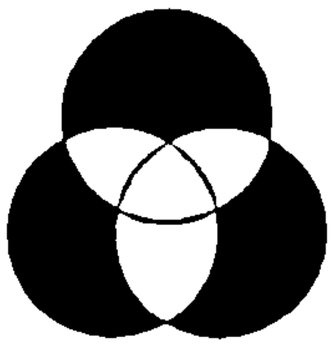


Figure 2-1
(based on Jenkins, 1997)

2.2 The primary fields



The three primary fields are global logistics services, exchange relationships and social networks, and intermediaries. Within each there are several distinct areas of relevance and interest. As a field, global logistics services covers both the provision of the services and the difference from domestic logistics as well as the participants in global supply chains. Within the primary field of exchange relationships and social networks one may find social networks, supply chains, dyadic relationships, corporate boundaries, and the relational/transactional continuum. Finally, the field entitled intermediaries covers the mediating function, intermediaries and information asymmetry, and disintermediation.

2.3 Global logistics services

What drives global logistics services? Cooper considered the demand for these services from the point of view of the large manufacturer (Cooper, 1994). His taxonomy was based on the geographic spread of the sourcing and production requirements of these manufacturers. Sourcing could be world-wide or local while production could be concentrated in one area or dispersed regionally or globally. Examples of world-wide sourcing and concentrated production would be Boeing or Cray; an example of local sourcing and concentrated production would be Mercedes-Benz. Similarly, examples of local sourcing but dispersed production would be fast-food manufacturers such as Coca-Cola and McDonalds. Companies with production and sourcing such as Boeing or Cray would consider both import and export global logistics services important whereas those

companies similar to McDonalds with little need for import or export services would not deem either relatively important. Those companies with local sourcing/concentrated production similar to Mercedes-Benz would place emphasis on export global logistics services.

2.3.1 Globalisation, homogeneity, and standardisation

Globalisation as defined by Levitt means going global to obtain economies of scale and/or scope (Levitt, 1983). The globalisation of logistics is part and parcel of the changes occurring in international trade. The globalisation of markets (Coca-Cola, MacDonalds), sourcing (Sony, Philips), production (Ford, Toyota), national economies (interdependencies of currencies), and even information (Internet) is associated with this trend. Browne believes that the globalisation of retailing and manufacturing as well as advances in telecommunications have altered global distribution and logistics (Browne, 1991).

Homogeneity or standardisation of services world-wide is often a feature of globalisation. Yet when does one characterise a provider of logistics services as 'global'? Often such a 'global' provider may offer services world-wide but may not have a global network of offices. Cummings cites the example of Kintetsu which became the largest airfreight forwarder in the world through huge market share in Japan alone (Cummings, 1992a). There is a major difference between being a provider of global logistics services and being a global provider of logistics services.

When we speak of global transportation the key word is *global*. Global trade implies distance, national boundaries, and tariff and non-tariff boundaries. Trade *within* a trading bloc such as that between members of the European Union should not be considered "global". With the advent of the Single European Market in 1992 tariff and non-tariff barriers supposedly no longer exist.

As natural obstacles to global transportation, oceans also demarcate nations and, more importantly, trading regions and exclude modes of global transport such as rail, motor freight and canal. In global trade the major modes of transport are sea and air (Branch, 1985, 1994).

The U.S./Canada border is one of the longest international borders in the world; Canada and the U.S.A. are each other's biggest trading partners. Much of this trade is obviously shipped via rail or road, contrary to the above concept. Under NAFTA (North American Free Trade Act), trade across this border is unlike that between EU member states. For example, Customs entries are still required as well as certification as to origin. While trade between Canada and the U.S.A. faces insignificant tariff (though notable non-tariff barriers) and the distances are sometimes considerable, many American companies do not consider it as "foreign" trade. Murphy, Daley and Dalenberg examined international freight forwarders' perspective of the difficulty of dealing with various countries (1993). There were some surprises, notably Canada's ranking as fifth easiest country for arranging international freight operations. The authors speculate that freight forwarders are less likely to be involved in Canadian/American trade and consequently have less experience with exporting to Canada. Freight forwarders are probably less likely to be involved because shippers do not consider exporting to Canada as "foreign" and therefore do not consider using an intermediary such as a freight forwarder. In the following research the emphasis is on *global trade* meaning inter-regional trade not that within trading blocs. In addition, the transport modes are, in the main, limited to deep-sea and air.

In his preamble as editor of a 1981 issue of International Journal of Physical Distribution & Materials Management and in a subsequent book, Davies addresses whether or not global logistics should simply be considered as part of domestic logistics. He states that "...even if academics were able to

agree one way or another, would practitioners see their arguments as being unrelated to practical problems and therefore irrelevant?" (Davies, 1981a and 1981b). Practitioners might agree with Bartlett and Ghosal who differentiated global logistics from domestic logistics in six areas (Bartlett & Ghoshal, 1987):

1. contrast in host government policies
2. diversity of modal rules and regulations
3. customs and trade policies
4. varying equipment and infrastructure available and required
5. disparate business practices
6. differing operating procedures such as more complicated documentation and different currencies

In 1981 Gray and Davies considered the study of global logistics under-developed with too little emphasis on *inter*-company trade (that between unrelated companies) in logistics studies while, in international marketing research, there was a similar minor emphasis on *intra*-company trade (that between related companies) (Gray & Davies, 1981). Intra-company trade is significant - Julius estimated that one-third of American exports were to related companies and another one-third were from American-based foreign companies exporting goods back to their home markets (Julius, 1990). He also estimated that intra-company trade within OECD countries accounted for more than one-half of all trade.

Many writers have widely varying views on the specificity of global logistics as compared to "common, garden variety" domestic logistics. Some of the major differences in global logistics involve national infrastructure, culture, language, laws, and currencies. Most global logistics literature can be divided into that which looks at the area from the international shipper's point of view and that which looks at it from the global logistics provider's perception. Most articles stress global logistics from the point of view of the

international company moving from domestic to global operations and only peripherally mention the providers of the necessary global logistics services.

One of the earliest attempts to differentiate global from domestic logistics was that of Slater who listed a variety of factors involved (Slater, 1978):

1. variations in operating environment such as cultural, educational, technological, climatic, and geographic,
2. variations in objectives, linguistics, and working hours of operating personnel,
3. locations of production, warehousing and marketing support facilities,
4. volume of capital invested in inventories within the system,
5. world-wide sourcing of raw materials and components,
6. availability of alternative marketing channels,
7. barriers to trade such as tariffs, quotas, and exchange control,
8. complex management information systems,
9. availability of alternative transport modes,
10. geographically longer channel structures.

Bender approached global logistics by stressing its increasing importance due to the continuing growth of international trade and the streamlining of international trading practices (Bender, 1986). In addition Bender spoke of the growing integration of domestic and global logistics systems. Such integration occurs when international companies take advantage of local conditions and regulations and 'optimise the total logistics system', building global homogeneity through the concept of 'thinking global but acting local'. Stock and Lambert simplified the differential conditions to include longer transportation distances, higher inventory levels, and longer order cycle times for the traders involved (Stock & Lambert, 1987). Overlooked were the complexities of infrastructure, multi-modal involvement, documentation, customs regulations and trade barriers, and government obstacles. Bartlett and Ghoshal did look at the different operating procedures followed by

global logistics providers when considering the differences between domestic and global logistics. These different operating procedures included more complex documentation, currencies, infrastructure, and transport assets such as ships and aeroplanes (Bartlett & Ghoshal, 1987). They also mentioned the participation of freight forwarders as a key difference though they described them, in general, as 'monopolistic' – individually and globally, probably no forwarder could be considered monopolistic except, perhaps, oligopolistic in certain product or geographic niche areas.

Braithwaite looked at global logistics partially from the logistics service provider's point of view when he included unreliable lead and transit times and multiple modal and consolidation/groupage options amongst the characteristics of global logistics (Braithwaite, 1992). Many of Bowersox's parameters involve the providers of global logistics services. His four D's: documentation, distance, diversity and demand capture some of the important areas pertaining to providers (Bowersox, 1993). The amount and complexity of documentation; the method of payment and terms of sale as well as liability and ownership; the distances involved and support infrastructure required are all important to both shippers and their global logistics service suppliers. Bowersox agrees that such complexities encourage shippers' dependency on logistics providers. Byrne, vice-president of A.T. Kearney, a management consulting firm, recognised the trend towards globalisation when he stressed its importance as a force influencing logistics in the 1990's (Byrne, 1993). To this growing list of global/domestic differences Cooper added technology through cheaper telecommunications; the reduction in trade and foreign investment barriers; the economies of scale obtainable through globalisation; and certain logistics innovations such as postponement strategy (Cooper, 1993a, 1994).

In contrast Zinn and Grosse demonstrated empirically that global distribution was a misnomer amongst American multinationals and would

probably remain so for the foreseeable future (Zinn & Grosse, 1990). Bender considered similarities between domestic and global logistics from the shipper's point of view (Bender, 1986). The "links and nodes" in the logistics network may be of greater number in global distribution but by-passing nodes and consolidating links is common to both domestic and global distribution. Other similarities mentioned by Bender included cost/service trade-offs and management techniques.

2.3.2 The participants in global freight transport

Excepting those providers of predominantly domestic ancillary services such as warehouse keepers or local drayage firms, the major players in global distribution are the shippers, the line-haul carriers and intermediating firms exemplified by freight forwarders. The distinction between and amongst these three participants is not precise as some of the global logistics functions which may delimit a shipper, carrier, or intermediary can be, and often are, performed by any of them.

The shipper

As the initiator of global freight transactions the shipper is the focus for logistics service providers. The word 'shipper' is a generic term which, although normally equated with the exporter, will be used in this research to cover that party with whom the purchase of global freight originates. Depending on the terms of trade, if the supply chain is a traditional 'push' system the freight transaction will originate with the exporter or vendor of the product; if the supply chain is a 'pull' system the freight transaction will originate with the importer or purchaser of the product.

The terms 'exporter' or 'consignor' are often interchangeable with shipper though there are subtle ownership and responsibility differences. In practice, from the carriers' and intermediaries' viewpoint the individual or firm that makes the shipping decisions and controls the goods is the shipper

regardless of actual ownership. In the freight forwarder's menu of services some “products" are focused at the exporting side (i.e., consolidation, packaging) and others at the importing side (i.e., break bulk, customs clearance). Shipper/exporter/consignor and receiver/importer/consignee labels could all be grouped as traders.

The carrier

In global or domestic logistics the carrier is customarily the provider of the line-haul conveyance using transport assets under his control. The prime modes of transport are by air, water (deep sea, coastal, or canal), road, or rail. Freight can also be transported multi-modal, by carriers operating in more than one mode. MTOs (multi-modal transport operators) offer multiple modes of transport or intermodal transport (combined transport i.e., road/rail or sea/rail on a single transit movement). Carriers involved with international transportation commonly deal with both intermediaries (nominally freight forwarders) and directly with shippers.

Deep-sea freight has always been the dominant mode of global transport; in volume terms 98% of world trade is moved by sea (Branch, 1994). The advent of containerisation in the 1930s and its growth in the 1960s made it simpler and more cost-effective. The use of containers in shipping and unit load devices in airfreight offers door-to-door movements, reduced handling, faster transit times, and has facilitated the development of consolidation and break-bulk shipments (Branch, 1994). Groupage and break-bulk were the raison d'être of the traditional freight forwarder who could offer LCL (less than container load) services to the smaller shipper who couldn't fill an entire container.

However, while sea transport dominates in terms of volume of freight it is a different story when the *value* of freight is measured – between 20% and 30% of total world trade measured by value is moved via airfreight as compared to 1% by volume (Branch, 1994). Unlike many other transport

asset providers, most air carriers act as wholesalers of space rather than as retailers of a transport service. At the beginning of the jumbo airliner era (circa 1960s) the airlines "sold their birthright to the freight forwarders"[1], undervaluing the freight market to concentrate on the more lucrative passenger market. With these jumbo jets, airlines could double their passenger load but at the same time had ten times the belly space available for freight. Freight forwarders inherited the retailing of airfreight as an adjunct to traditional forwarding via ocean.

In addition to the often self-described love/hate relationship between airlines and airfreight forwarders, both parties faced a major competitor in the integrator. Entering the European market in the early 70s, companies such as TNT, DHL, UPS and Federal Express have "integrated" both the line-haul services of the airline and the door-to-door and ancillary services of the freight forwarder (Sparks & Mathe, 1991; Gillis, 1995). In the global arena, the integrators are moving up the weight scale (into heavy freight) and down the time scale (by offering two, three, or four day postponed delivery) (Cooke, 1993; Bowman, 1994). By handling international freight in addition to express, this again brought integrators into direct conflict with freight forwarders and airlines. The conflict between integrators and airlines in this global arena is matched by that in the American domestic market: domestic integrators control approximately 92% of the market whereas airlines move only 8% of the shipments. However, airlines collected 25% of the revenue and carried half the total weight (Bradley, 1992).

The global logistics intermediary

As intermediaries, forwarders began as agents for the carriers wherein the contract of carriage was between the shipper and the carrier. The freight forwarder's influence grew with the advent of containerisation in both sea and air transport. Containerisation brought 'door to door' through transport

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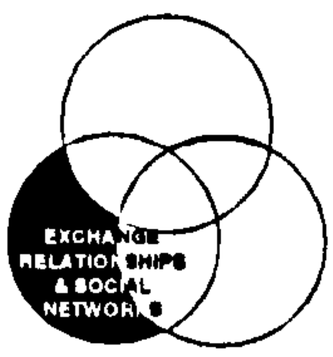
[1] Interview with *Mr. M., air carrier* – page 1

and made possible the selling of freight to shippers as a package of services. Freight forwarders eventually became principals in their own right and issued bills of lading in their own names (Tudhope, 1979). Baker indicated the difference in status by defining agents as "(those who) procure others who perform the carriage, storage, packing or handling of the goods – the shipper, through the forwarder as intermediary, enters into direct contractual relations with others" and principals as "(those who) enter into a contract of services with the shipper – even though others may carry out all or some of the services the freight forwarder is the only person (sic) with whom the shipper is in contractual relations" (Baker, 1993).

In the last few years many forwarders have even eliminated the term 'freight forwarder' from their corporate descriptions preferring a term like 'global logistics operator' (Eller, 1995). This change in responsibility and legal status from agent to principal and in corporate representation from freight forwarder to logistics provider mirrors the name change in the industry's own umbrella organisation. From the Institute of Shipping and Forwarding Agents to the Institute of Freight Forwarders to the present British International Freight Association, we can see the gradual change from 'agent' to 'forwarder' to the generic 'International Freight participant' (Tudhope, 1979; Davies, 1984; Baker, 1993).

2.4 Exchange relationships: Social networks and transactions



Commercial relationships between corporate bodies involve social and financial exchange, costs, and value. To paraphrase John Donne, the dyadic relationship (that which exists between two bodies) is not 'an island entire unto itself' (Donne, 1623); this relationship exists in a dynamic network of many relationships. Moving down from the macro network to the

micro dyadic relationship, the concept of exchange between the two dyadic partners is also changing. The view of supplier and buyer carrying out single ad hoc transactions under an aura of conflict is changing to that of a collaborative relationship. Finally, at the micro level of the individual organisation, what defines its own corporate boundaries? Which functions and processes are best kept in-house and which are best outsourced? Overall, where is value added and where do costs occur?

In Harland's research on the behavioural aspects of networks, chains, and dyadic relationships he defined supply chain management (SCM) on four levels:

1. the management of a network of interconnected organisations,
2. the management of a linear chain of organisations within this network,
3. the management of a dyadic relationship between any two organisations (within the above chain and/or network) and,
4. the management of the internal chain that integrates functions within an organisation (Harland, 1996).

Graphically, the nodes and links would be shown as follows:

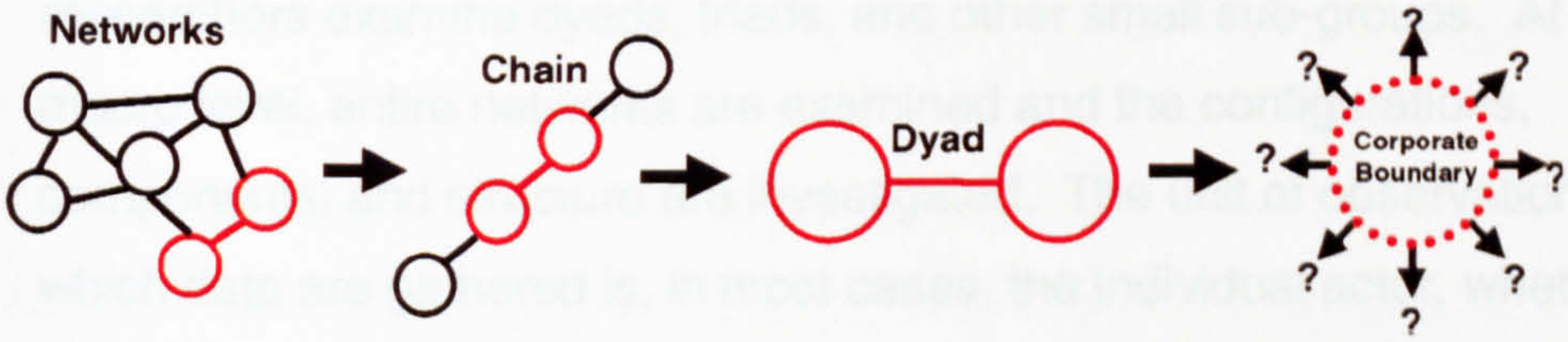


Figure 2-2

(based on Harland, 1996)

Because exchange relationships within a network or supply chain and those between two or three parties are important to the ensuing research there is a need to delve more deeply into the concepts involved. Similarly, the idea of an internal supply chain leads to questioning how much the organisation should perform in-house and what functions it should out-source – the "make or buy" question (Anderson & Weitz, 1986; McGinnis, Kochunny, & Ackerman, 1995; Maltz & Ellram, 1997; Poppo & Zenger, 1998).

2.4.1 Networks

In social network analysis (SNA) networks are described as "...a finite set or sets of actors and the relation or relations defined on them" (Wasserman & Faust, 1994, p:20). Actors are the social entities which equate to the nodes in a network; these social entities can be individuals, firms, or other collective social units. Relational or social ties are the links between actors. At the corporate actor level examples of these ties include physical connection (director acquaintance and interaction and overlapping boards of directors: Rogers, 1974), association (influence and politics in organisations: Knoke, 1994), or transfers of material resources (inflow/outflow transfers of money: Galaskiewicz, 1985; resource transfer: Laumann & Knoke, 1987). These relational ties are not properties of individual actors but of two or more actors. Dyads are pairs of actors and the linkages or ties between them whereas triads are triples of actors and their associated ties.

SNA is based on measurements of network size, density, centrality, tie strength, and network range (Marsden, 1990). At the micro level, network researchers examine dyads, triads, and other small sub-groups. At the macro level, entire networks are examined and the configurations, components, and structure are investigated. The unit of observation from which data are gathered is, in most cases, the individual actor, whether that actor is an individual or an organisation or other social group. These data take two forms: relational (or structural) data which differ from attribute (or compositional) data in that the former exist *between* actors while the latter are *ascribed* to individual actors. In SNA attributes are associated with *nodes* while relational data are associated with *linkages*.

The application of SNA to logistics and supply chain flow considers, first and foremost, the supply chain as a linear and sequential string within the larger supply network. In the following research the major SNA concepts used are those of the separation of attribute and relational data and the use of

graphic depictions of relationships. Supply chain research seems to share graphical modelling with SNA. For example, in Figure 3A one would consider the airline as a direct part of the supply chain whereas in Figure 3B the airline is a direct part of the forwarder's supply chain only. Gray described international freight transport in the context of marketing channels as made up of two channels: the trading channel and the transport channel (Gray, 1980). Therefore, in Figure 3B, the forwarder becomes a node in both the "trade" supply chain and the "transportation" supply chain. Figure 3A describes the forwarder more as an agent whereas in Figure 3B the forwarder acts as a principal.

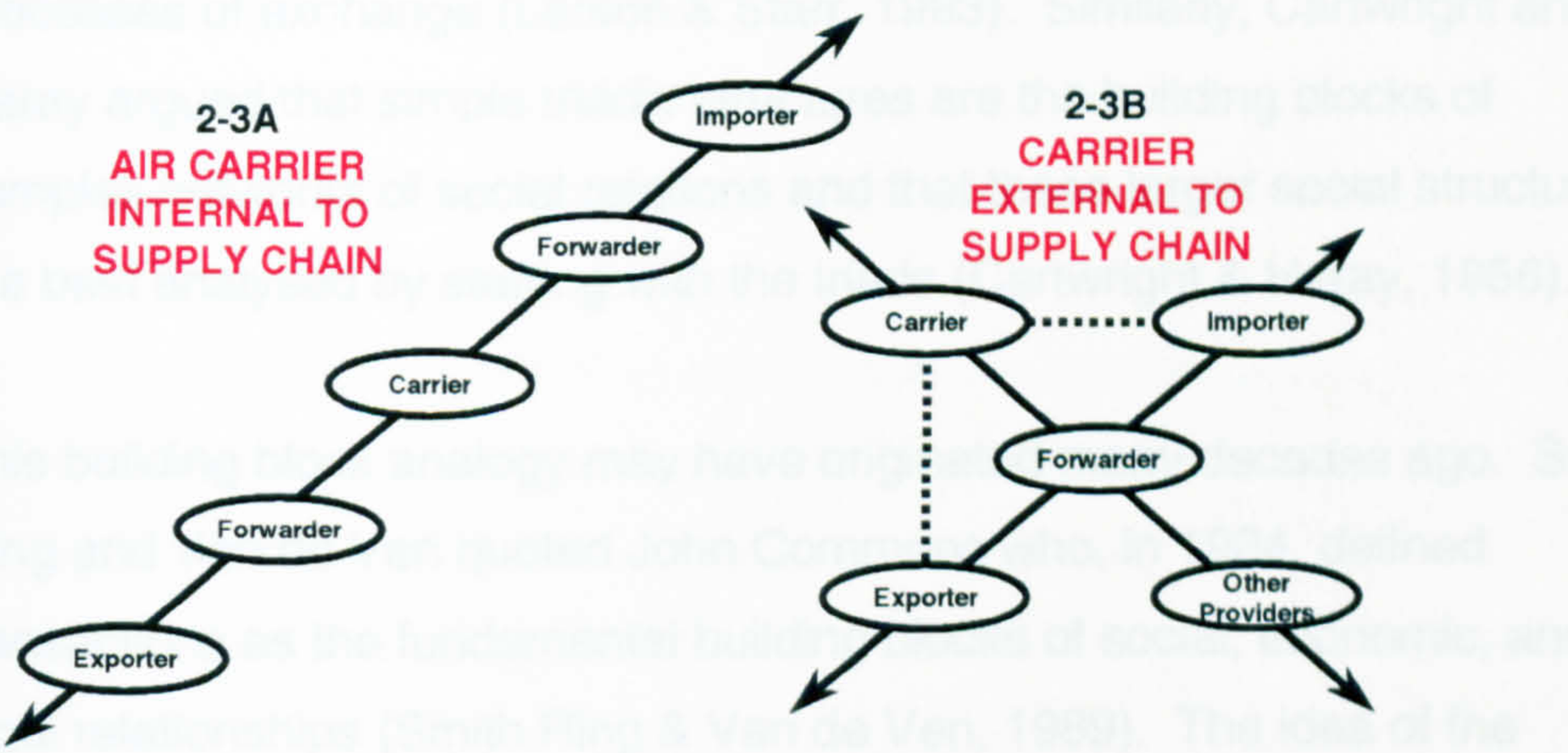


Figure 2-3

In SNA the relationships investigated are, by necessity, restricted. In the examples mentioned previously only certain aspects of the relationship are examined (i.e., resource transfer, knowledge of or association with, kinship or connection, etc.). Especially at the macro network level SNA does not lend itself to a deep or broad examination of the relationship. Many of the indices or measures used fall into one or more of the following categories: network size (number of direct ties), network density (mean strength of connections), centrality, tie strength (intensity, duration, or frequency), or network range (size or density) (Marsden, 1990).

2.4.2 Dyads and triads

At the micro level researchers examine dyads, triads and other small sub-groups which make up a network (Galaskiewicz & Wasserman, 1994). At the dyadic level this economic interaction between two parties in large part comprises an exchange relationship. A network model of organisational formation devised by Larson and Starr suggests networks are built up from simple, single-dimension dyadic exchanges by converting the social and affective relationships and the economic and instrumental ties into socioeconomic exchanges and then layering these with additional processes of exchange (Larson & Starr, 1993). Similarly, Cartwright and Haray argued that simple triadic structures are the building blocks of complex networks of social relations and that these larger social structures are best analysed by starting with the triads (Cartwright & Haray, 1956).

This building block analogy may have originated many decades ago. Smith Ring and Van de Ven quoted John Commons who, in 1934, defined transactions as the fundamental building blocks of social, economic, and legal relationships (Smith Ring & Van de Ven, 1989). The idea of the transaction as the major component of a socioeconomic exchange was explored by Gerlach and Lincoln who suggested that research at the dyad level would help test two important theoretical frameworks often used in interorganisational research – resource dependence theory and the transaction cost paradigm (Gerlach & Lincoln, 1992). The economic transaction is a key but often static element in a dynamic and evolving relationship; Sahlins said, "A material transaction is usually a momentary episode in a continuous social relation", (Sahlins, 1972). However, Czepiel suggested that an individual transaction is not so much a discrete exchange as a continuation in a series of exchanges that may extend into the future. As these exchanges accumulate over time they may be transformed into a socioeconomic relationship (Czepiel, 1990).

2.4.3 Exchange

The various permutations possible with the socioeconomic relationship between buyer and seller has led to numerous classifications. Within his Relational Exchange Theory Macneil characterised the discrete and relational polar archetypes along 12 dimensions (1980). The IMP Group looked at these relationships between buyer and seller as a continuum. Their Interaction Model is based on four elements:

1. *The interaction process* – broken down into four exchange episodes consisting of product or service exchange, information exchange, financial exchange, and social exchange,
2. *The participants in the interaction process* – including individual and corporate interaction and organisational size, structure, strategy, and experience,
3. *The atmosphere affecting and affected by the interaction*,
4. *The environment within which the interaction takes place* (Cunningham, 1982a; Cunningham & Turnbull, 1982; Cunningham, 1982b; Hakansson, 1982).

From this initial work came the classification of the relationships between buyer and seller as a range of relationships with the poles characterised by, at one end, discrete, single transactions and, at the other end, long-term relational exchange. Dwyer et al extended the concept of buyer-seller relationships from discrete transactional episodes to ongoing relationships (Dwyer, Schurr, & Oh, 1987). Ellram expanded the continuum beyond the relational "partnering" stage to joint ventures, equity interest, and merger or acquisition (Ellram, 1991). Payne et al presented a particularly interesting continuum by characterising the various stages from transactional to relational as prospect, customer, client, supporter, advocate, and finally partner (Payne, Christopher, Clark, & Peck, 1995).

In general these polar archetypes differ along a number of dimensions:

BUYER-SELLER RELATIONSHIPS: POLAR ARCHETYPES

Dimension:	Transactional	Relational
Timing of exchange	discontinuous	expectations of continuity
Horizon	short –term	long-term outlook
Social interaction	minimal, often adversarial	partnership, formal and informal communication
Expectations for relations	conflict expected	potential conflict counterbalanced by trust
Personal relations	minimal, societal norms	important
Co-operation	minimal	joint efforts, adjustment
Planning	focus on substance of exchange	focus on process of exchange
Objective	minimum cost	maximum value
Key skills required	negotiation, deal making	analytic/problem solving
Division of benefits & burdens	sharp and exclusive allocation	sharing and adjustments

Table 2-1

Adapted from: Macneil, 1980; Noordewier, John, & Nevin, 1990; Copacino, 1990; Gibson, Sink, & Mundy, 1993; Payne, Christopher, Clark & Peck, 1995.

Some researchers have applied this relationship continuum to the buyer-seller relationship in logistics. Bowersox et al characterised transactional relationships as either single or repeat purchase (focusing on expectations of continuity) and relational relationships as strategic alliances. These strategic alliances range from partnership agreements to third party arrangements to integrated service agreements. Formalisation of the contract and commitment to each other increase as one moves from single purchase transactions to integrated service agreements (Bowersox, Daugherty, Droge, Rogers, & Wardlow, 1989). In a subsequent article

Bowersox suggested logistics partnerships differed from generic co-operative business arrangements partly because of this focus on a relationship continuum rather than a series of discrete transactions (Bowersox, 1990).

When speaking of shippers as buyers of logistics services Copacino also differentiated between transaction and relationship buying. He suggested four attributes characterised this difference: *horizon* – short versus long term; *objective* – minimum cost versus maximum value; *relationships* – adversarial versus partnerships; and *key skills* – negotiation versus analytic (Copacino, 1990). Gibson et al presented a model of shippers' strategy in selecting carriers. The five stages ranged from short-term, price-focused to long-term, value-added:

1. *Exclusive price focus* – characterised by price sensitivity, arm's length transactions, short term contracts, and minimal emphasis on quality
2. *Carrier reduction focus* – by concentrating freight with fewer carriers can leverage greater efficiency and improved service plus obtain price discounts
3. *Transitional focus* – does not consistently monitor suppliers' performance or may still occasionally base selection purely on price.
4. *Measurement focus* – objective selection and systematic measurement criteria
5. *Continuous improvement focus* – highly structured evaluation procedures, focus on quality and long-term alliances with the supplier-carrier looked upon as an extension of the company.

These stages emphasise the range of dimensions indicated in the above table (Gibson, Sink, & Mundy, 1993).

Relational Exchange Theory (RET) focuses on those exchange relationships between discrete transactional and vertical integration.

Macneil examines control in exchange relationships in terms of the presence and relative strength of exchange behaviours and the relationship orientation of the exchange parties (Macneil, 1980). Artz accepts that an exchange relationship is affected by economic factors but considers the influence of behaviours of the exchange partners highly important (Artz, 1999).

When discussing socioeconomic relationships one must keep in mind that the social aspect of the relationship exists between individuals in the organisations. Interaction takes place both at the corporate and the individual level. The IMP Group realised this with the interaction process and participant elements of their Interaction Model (Cunningham & Turnbull, 1982; Cunningham, 1982a; Cunningham, 1982b). When speaking of buyer-seller relationships in freight transport Whyte referred to individual and corporate relationships as described in the IMP Group's Interaction Model (Whyte, 1993). However, Kumar et al suggested two problem arise when attempting to use multiple informants in interorganisational research: the difficulty of finding two or more knowledgeable informants within an organisation and the data collected from multiple informants often fail to demonstrate perceptual agreement (Kumar, Stern, & Anderson, 1993). Moore and Cunningham cited Kumar, Stern, and Anderson's work as justification for using single key informants within the shipping organisation in their work on social exchange behaviour in logistics relationships (Moore & Cunningham, 1999).

2.4.4 Corporate boundaries and exchange relationships

Moving down to the individual organisational level of the macro/micro continuum the focus becomes the extent of the organisation: What demarcates this corporate boundary? Essentially this becomes a question of "make or buy" – what processes should be done in-house under the corporate umbrella and what processes should be out-sourced to external organisations? This decision is at the centre of Coase's book entitled "The

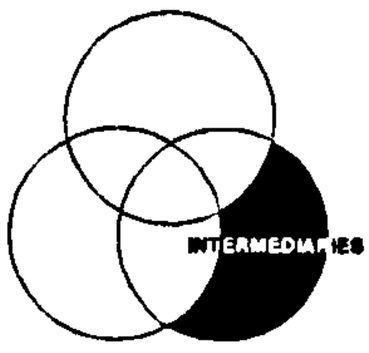
Nature of the Firm" (Coase, 1937). He suggested that in order to understand what a firm does, one must understand why it exists and what forces govern the organisation of economic activity. This seminal book compares the market to the firm. Coase asks why some transactions are controlled by the price mechanism in the marketplace while other transactions are managed within the organisation. He concluded that firms exist because the cost of organising them is cheaper than the costs of transacting with individuals in the open market. Firms should only undertake those activities that cannot be performed more cheaply in the market. Coase argued that "a firm will tend to expand until the costs of organising an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of exchange on the open market or the costs of organising in another firm" (Coase, 1937, p. 395).

This organisational process resulted initially in an either/or decision: to vertically integrate within a *hierarchy* or to enter the *market*. As with the relationship continuum discussed previously, recent research has focused on filling in the range between these two polar archetypes. Williamson, the major proponent of Transaction Cost Theory, viewed the three types of exchange relationship discussed by Macneil (1980) (discrete, neoclassical, and relational) as control alternatives that fall between market-based transactions and vertical integration (1985). Anderson's work on the salesperson considered only the extremes of hierarchy (salesperson as employee) and market (salesperson as manufacturer's representative) (Anderson, 1985; Anderson & Weitz, 1986; Anderson, 1988).

Day and Klein offered a continuum between free market transactions on the spot market and full vertical integration (Day & Klein, 1987). The vertical co-operative relationships within these extremes were classified by the direction – upstream or downstream – of the primary party. For example, forward or downstream relationships are franchising, co-operative marketing arrangements, or distribution channel joint ventures,

whereas backward or upstream relationships are long-term supply contracts and supply plant joint ventures. Gates accepted intermediate control strategies in looking at technological co-operation in the semiconductor industry (Gates, 1989). Klein et al specifically set out to observe the intermediary alternatives between the polar extremes when examining the vertical control options and channel integration of exporters in international markets (Klein, 1989; Klein, Frazier, & Roth, 1990; Klein & Roth, 1993). Noordewier et al brought the in-house/outsource continuum closer to the relationship continuum by organising possible purchasing arrangements based on relational elements (Noordewier, John, & Nevin, 1990). Thorelli defined networks as interfirm relationships somewhere between markets and hierarchies (Thorelli, 1986). Dwyer, Schurr, and Oh concur, describing these intermediate relationships as the "largely neglected middle ground" between market and hierarchy (Dwyer, Schurr, & Oh, 1987).

2.5 The intermediary



Traditional marketing theory views the intermediary as, "(an) organisation that supports exchanges between producers and consumers, increasing the efficiency of the exchange process by aggregating transactions to create economies of scale and scope" (Alderson, 1954; Coyle, J. & Andraski, J., 1990). The intermediary performs a variety of functions for buyers and sellers beyond offering economies of scale and scope. These mediating functions differ greatly between those intermediaries involved in goods and those involved in services. Intermediaries involved in products could include any supply chain member between the primary manufacturer and the ultimate consumer including wholesalers and retailers. However, services have much different characteristics which more sharply define the

intermediating players or nodes in a service-based supply chain. Palmer distinguishes services from products along five dimensions:

1. *Intangibility*: Buyers have to rely on surrogate indicators such as personnel and equipment appearance, price, and reputation, not on a tangible product. While both services and products embody some degree of intangibility it is far higher with services than with products.
2. *Inseparability*: Production of the service cannot be far removed from its consumption. Customers are directly involved in the production of the service.
3. *Variability*: The processes of production of the service vary widely.
4. *Perishability*: As with some products services cannot be stored.
5. *Ownership*: Associated with both intangibility and perishability, no ownership of the service can be transferred to the buyer (Palmer, 1994).

Much of the value added and/or cost savings offered by intermediaries in product-based supply chains are unavailable to intermediaries in service-based supply chains. For example, because services are intangible, perishable, and cannot be separated from their production they cannot normally be purchased in bulk, inventoried, and made available as intermediaries do in product-based supply chains.

2.5.1 The intermediating function

Most theoretical work concerning intermediaries and services (as opposed to products) has been carried out in the field of financial intermediation (Rubinstein & Wolinsky, 1987; Yavas, 1992; Gehrig, 1993; Bhattacharya & Yavas, 1993; Bester, 1995; Yosha, 1997; Allen & Santomero, 1997). Some general characteristics of these articles are intermediary ownership versus consignment (or matchmaking versus market making (Yavas, 1992)), the difference between the purchase price and the selling price (the bid/ask

spread), competition, risk and information asymmetry, and the costs of searching and bargaining.

In these articles, when considering intangible services one thing stands out: the imbalance in knowledge between the buyer and the intermediary (information asymmetry) especially as it relates to seeking sellers. This point is similarly raised in Lewis and Talalayevsky's article concerning threatened travel agents in which the authors suggest an emerging role for travel agents may be that of information filter and integrator between provider (airline) and consumer (passenger) (Lewis & Talalayevsky, 1997a). Travel agency is a particularly good example as this industry is similar to freight forwarding, especially regarding the agent/principal dichotomy discussed earlier.

The concept of information asymmetry between buyer and seller (as opposed to buyer, intermediary, and seller) originated with Akerlof and his paper on purchasing defective automobiles entitled "The Market for Lemons". Akerlof called the inability to ascertain a potential supplier's true characteristics prior to dealing *adverse selection* (Akerlof, 1970). The buyer must incur costs in selecting and screening appropriate suppliers a priori. In their various works on financial intermediation Demsetz (1968), Rubinstein and Wolinsky (1987), Yavas (1992), Gehrig (1993), and Bhattacharya and Yavas (1992) all explored the notion that intermediaries reduce the search costs that buyers and sellers incur to find each other in order to trade. Much of this research differentiated between *intermediated markets* (Gehrig, 1993) in which *marketmakers* (Yavas, 1992) profit from the bid-ask spread and *search markets* in which *matchmakers* merely bring together buyers and sellers. In these definitions marketmakers are principals whereas matchmakers are agents.

Information asymmetry prior to transaction is a concept commonly found in Agency theory (Akerlof, 1970; Bergen, Dutta, & Walker, 1992). This form of

information asymmetry leads to additional direct costs in the form of searching, selecting, and screening potential exchange partners. It can also lead to opportunity costs from choosing an inferior supplier. However, not all writers accept that the costs of searching for potential exchange partners are costs related to the (eventual) transaction. Allen considers the costs of finding a trading partner or the best price for a desired good or service to be information costs independent of the transaction (Allen, 1991). These information costs could be precursors of other costs involving the transaction.

In their work on intermediaries and electronic commerce Sarkar et al listed the functions performed by intermediaries for consumers and producers. In most cases these functions appear to either be information or relationship based. Information based functions fulfilled by intermediaries include search and evaluation, needs assessment and product matching, product information dissemination, and provision of customer information. Relationship based functions include customer and producer risk management, purchase influence, and integration of consumer and producer interests (Sarkar, Butler, & Steinfield, 1995). A similar relationship and information based intermediating function – that of linking organisations which would not otherwise be connected - was suggested by Cosimano (Cosimano, 1996).

A key trend in buyer-seller relationships is the tendency towards supplier reduction with more rigorous selection and greater development of the partnership of the reduced supplier base (Cavinato, 1992; Mckinnon, 1994; Harland, 1996; Stump & Sriram, 1997). At the same time, dealing with a limited supplier set may restrict the buyer getting better prices or other attributes by limiting his choice (Barua, Ravindran, & Whinston, 1997). In their seminal work on e-commerce Malone et al built on the work of Baligh and Richartz (1967) and Malone (1985) regarding brokers. They define a broker as an agent who is in contact with many potential buyers and

suppliers and who helps match one party to the other. By so doing the broker (as intermediary) substantially reduces the need for buyers and suppliers to contact a large number of alternative partners individually (Malone, Yates, & Benjamin, 1987). Rao et al extended this concept by suggesting a major function of the logistics intermediary was the elimination of the myriad of supplier relationships maintained by the logistics buyer (Rao, Young, & Novick, 1993).

In general, intermediaries offer the buyer the benefit of a lower number of supplier relationships to develop and maintain while at the same time offering the advantage of a wider choice of suppliers.

Therefore, intermediaries offer the buyer a reduction in the costs of:

1. searching for suppliers (information asymmetry) and
2. developing and maintaining relationships with a plethora of suppliers while still offering a wide range of choice (supplier reduction).

Search and Development Costs: Buyer/Supplier Interfaces

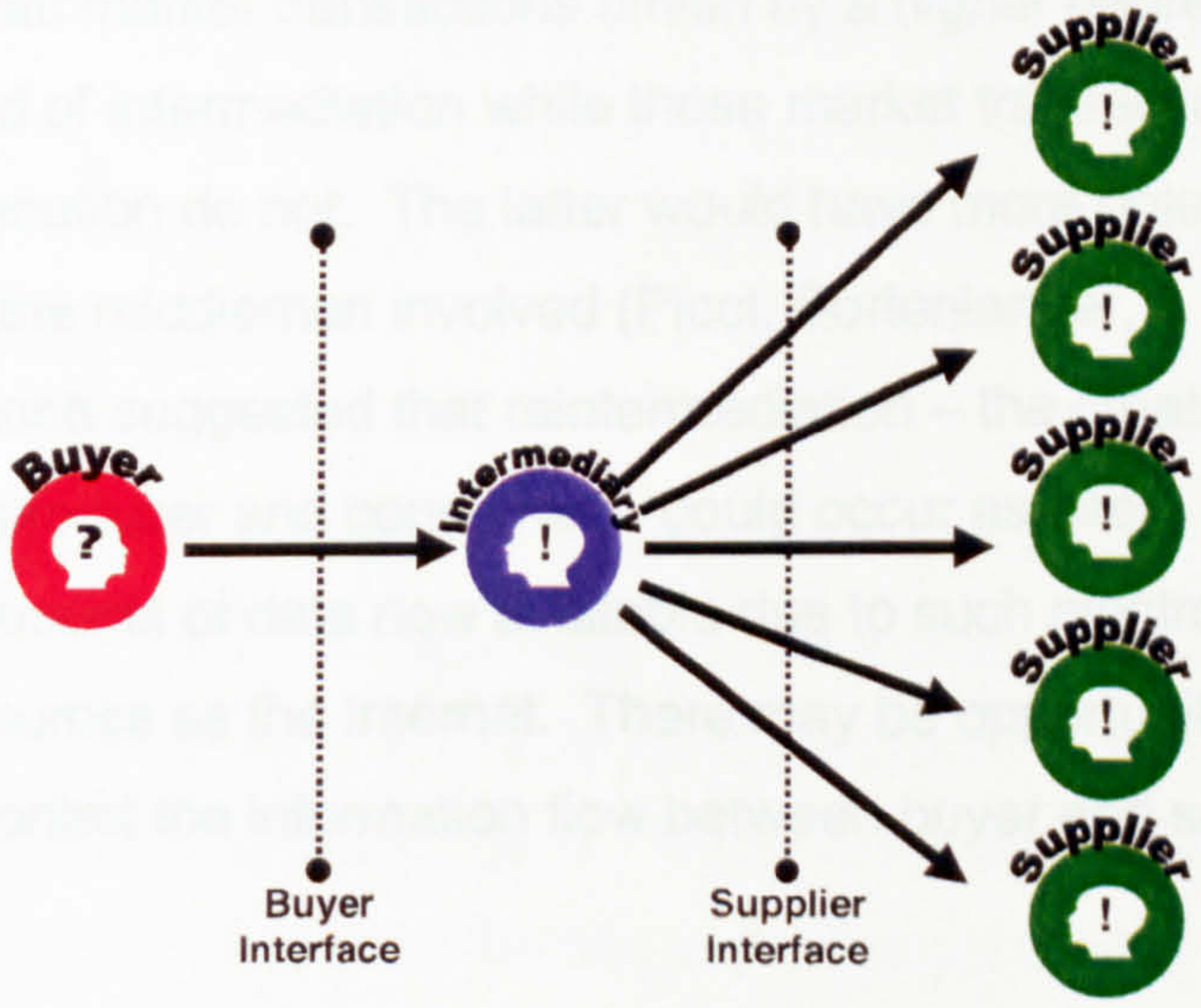


Figure 2-4

Using these informational and relational parameters the service intermediary can be defined as:

> *(one who) reduces or eliminates the need for a buyer to form exchange relationships, ad hoc or relational, with a number of suppliers by concentrating the buyer's need for information at the buyer interface and expanding the buyer's requirement for choice or selection at the supplier interface.*

2.5.2 Disintermediation

A common theme in the literature on e-commerce, especially as it relates to the Internet, is the disintermediation or elimination of middlemen (Jock, 1995; Tapscott, 1996; Harrington & Reed, 1996; Picot, Bortenlanger, & Rohrl, 1997; Wigand, 1997). As supply chains contract because of the desire of some of the members to bypass both upstream suppliers and downstream customers some of the nodes and links may be eliminated. Jock recites the story of an example of 15th Century disintermediation when the printing press was invented and monks found their primary occupation of manuscript writing threatened (Jock, 1995). Using principal-agent theory Picot et al suggest that market transactions driven by a higher degree of consulting have need of intermediation while those market transactions based on simple execution do not. The latter would have more potential for disintermediation of the middlemen involved (Picot, Bortenlanger, & Rohrl, 1997). Finally, Tapscott suggested that reintermediation – the creation of new value between producer and consumer – could occur as users try to manage the huge amounts of data now available due to such electronic information media sources as the Internet. There may be opportunities for new middlemen to control the information flow between buyer and seller (Tapscott, 1996).

2.6 Summary

This chapter has examined the literature and prior research involving the three primary fields of the field map: global logistics services, exchange relationships, and the intermediary. The transportation of freight on a global scale appears more complex than national or regional transport given the distances and physical and non-physical barriers involved. While sea freight still dominates both in terms of value and weight, airfreight is increasing in importance especially for high value-density products. Major players in the provision of global logistics services are freight forwarders and integrators. The former is, in essence, unique to global freight transport. A crucial evolution in freight forwarding has been the change in legal status and accountability from agency to that of principal. As agent the agreement of transportation was between the shipper and the carrier. However, as principal the freight forwarder became synonymous with other carriers.

The field concerning exchange relationships looked at commercial exchange between parties ranging from a macro (networks and supply chains) to a micro viewpoint (dyads and corporate boundaries). What became increasingly important is the corporate boundary of a firm: at what point does the firm decide to carry out a process in-house or out-source it to the market?

Three conceptual frameworks were examined. The first concerned social network analysis in which the relationships and the actors involved were likened to links and nodes in a graphic representation. Data would then become both relational and attributive. The second concept was the relationship continuum with its extremes of transactional and relational purchasing. The growing trend appears to be a shift towards relational exchange. The third concept was transaction cost theory with its "make or

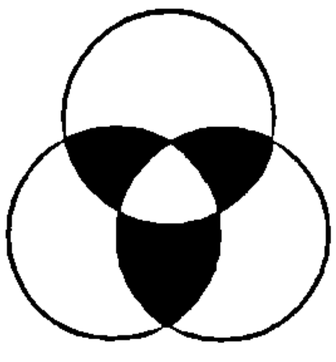
buy" decision. The idea of administration costs affecting this decision is particularly relevant to the prospect of disintermediating the middleman.

Finally, the field concerning the intermediary looked at the areas in which intermediaries exist – products and services. Concentrating on the latter, the focus became the value provided by the intermediary. Value arises from a reduction both in search costs because of information asymmetry and in the costs of maintaining a large number of supplier relationships. From this prior work a new definition of a service intermediary was derived.

The next chapter focuses in on the secondary and tertiary fields of the field map.

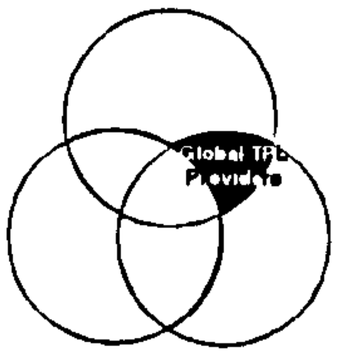
Chapter 3: Literature review: The secondary and tertiary fields

3.1 Introduction



The secondary fields are the overlap between two of the primary fields. They are narrower and more sharply defined than the primary fields from which they arise. The primary fields of global logistics services and intermediaries give rise to the secondary field of global third party logistics providers while global logistics services and exchange relationships result in the secondary field of global channel relationships and supply chains. Finally, the overlap between exchange relationships and intermediaries is governance and the market/hierarchy continuum.

3.2 Global third party logistics providers



There exist many definitions of the provision of *third party logistics*. Leahy et al provided a three tiered definition of 3PL (third party logistics) by stating it is:

1. analogous to out-sourcing or contract logistics
2. the use of an outside company to perform all or part of another company's materials management or product distribution.
3. the outsourcing of all or part of a company's logistics function. Relative to basic services, contract logistics offerings are more complex, encompass a broader number of functions, and are characterised by longer-term, more mutually beneficial relationships (Leahy, Murphy, & Poist, 1995).

Sink et al called 3PL services "....multiple distribution activities provided by an external party, assuming no ownership of inventory, to accomplish related functions that are not desired to be rendered and/or managed by the purchasing organisation" (Sink, Langley, & Gibson, 1996). Lieb and Randall suggested 3PL services involve "...outsourcing logistics activities that have traditionally been performed in an organisation. The functions can encompass the entire logistics process, or more commonly, selected activities within that process" (Lieb and Randall, 1996a & 1996b). Murphy and Poist described the relationship between shipper and 3PL provider as "...(one which), when compared with basic services, has more customised offerings, encompasses a broader number of service functions, and is characterised by a longer-term, more mutually beneficial relationship" (Murphy & Poist, 1998).

Global transportation is characterised by the intermediary (Lambert, Stock, & Ellram, 1998). Bowman states, "As the classic middlemen of transportation, forwarders are ideally situated to reconcile the often-conflicting systems of multiple shippers and carriers" (Bowman, 1994). In general, the presence of the freight forwarder differentiates global from domestic distribution (Cateora & Keaveney, 1987). Financially, forwarders are a major party in global logistics: in 1986 third parties accounted for twenty-six percent of international freight revenues (Sexton & Trenery, 1987). Several decades ago, Davies recognised the importance of the freight forwarder when he discussed the influence of this intermediary on the freight buying decision (Gray, 1981).

The industry of providing global distribution and other logistics services to exporters and importers has undergone many changes over the past few decades. Logistics users often want a global service and 3PL providers must adapt to provide supply chain solutions on a global scale (Harrington, 1998; Jackson, 1999). This global market seems to pursue door-to-door service and single-provider accountability (Muller, 1990). Global 3PL

providers have seen the clearly defined categories into which they previously – and comfortably – fit transformed. Not only does competition exist amongst traditional global intermediaries such as freight forwarders but relatively new interlopers such as express companies, integrators, airlines, and shipping companies have entered the global 3PL market.

Özsomer et al examined the changes affecting the freight forwarding industry by categorising them as:

1. *Changes within the companies involved in exporting* which included the growing competition in world markets; the strategic importance of time; development of trade with the third world; the growing importance of proficiency in global logistics; and the changing sourcing patterns which are paralleling the increase in intra-company trade,
2. *The expansion of services offered by freight forwarders* which included more diverse transportation services (inter-modal and single mode); trade services (such as customs and carrier documentation); and value-added services (vertically integrating, for example, into packaging and postponement strategy, insurance and management and consulting),
3. *Technological and environmental background factors* involving telecommunications and information technology (Özsomer, Mitri, & Cavusgil, 1993).

Using Porter's Five Forces Model to examine the competitive market for freight forwarding can result in the following:

1. *Substitutes* would include the integrators who have vertically integrated the intermediary/forwarder and carrier functions as well as those intermediaries who provide some of the services of a forwarder such as customs brokers, shipping agents, NVOCCs (non-vessel operating common carriers), and consolidators,

2. *New entrants* covers firms who could move or have moved into the forwarder's traditional field from other areas such as accounting firms, third-party logistics service providers, and information-based consultants,
3. *Suppliers* are the carriers, either single-mode (air, rail, road, sea) or multi-modal and ranging from short-haul, delivery to long-haul, international. Other suppliers to freight forwarders include providers of ancillary services such as warehousing and distribution. Many carriers and distribution companies now offer global 3PL services through subsidiary logistics firms,
4. *Customers* are the shippers or exporters and, by extension, the consignees or importers. Major exporters such as Benetton and Kodak have their own in-house freight forwarders (Damas, 1994; Bowman, 1995),
5. *Intra-industry competitors* are forwarders and those who define themselves as such; traditionally firms that neither own the goods nor means of conveyance but control the international and subsequent domestic movements of the goods. (Porter, 1980).

A key aspect brought up by Porter's model is the nebulous boundaries between these simplistic definitions. Some integrators, such as Emery Worldwide and Air Express International, operate as airplane-owning integrators within the U.S.A. and as traditional freight forwarders outside (Eddy, 1988; Gillis, 1995). Many carriers are reaching out to establish links with shippers who, in turn, are attempting to deal directly with carriers (Day, 1991; Phillips, 1994; Bowman, 1995). Freight forwarders are continually creating value-added services which lead to conflict with their major suppliers/carriers. And looming on the horizon are information-based firms attempting to by-pass the intermediary and connect the shipper and carrier directly. LogiCorp (now part of by Ryder) and *Encompass*, the global information system created by AMR (of American Airlines/SABRE fame) and CSX (parent company of Sea-Land) are two such examples (Bowersox, 1990; Bradley, 1992; Canna, 1993; Foster, 1996).

When discussing third-party contract logistics Muller used the classifications 'space-based' and 'data-based' vendors. The logistics function in space-based vendors is derived from operations based on transportation assets such as trucks, ships, airplanes, and warehouses. Data-based vendors are normally those without such assets who base their logistics services on the control of information (Muller, 1992). Sheffi, using a similar typology, called his classifications transport asset owning (TAO) and non-transport asset owning (NTAO) third party logistics providers (Sheffi, 1990). Harrington refers to Richard Armstrong, editor and publisher of "Who's Who in Logistics: A Guide to Third Party Logistics Providers" who suggested there are four types of 3PL providers (in terms of declining profitability):

1. domestic non-(transport) asset based firms,
2. international non-(transport) asset based firms,
3. transportation-based firms,
4. value-added warehouse-distribution-based firms

(Harrington,1998).

The two latter categories entitled *transportation-based* and *value-added warehouse-distribution-based* presumably include both domestic and international firms with transport and warehouse assets.

Building on this concept of transport-asset ownership one can differentiate global intermediaries (as opposed to generic 3PL providers) based on whether or not they own or control the assets used in transporting freight. Space-based or TAO global intermediaries have integrated vertically via ownership or control of these transportation assets hence the term 'integrator' for companies such as Federal Express, DHL, and TNT. Many people would not consider integrators to be pure intermediaries as they wear two hats: that of the intermediary when it comes to information, marketing and continuous control and execution of the movement of the goods and that of the carrier because of part or total ownership or control of the transportation assets used in the freight movement. The juxtaposition of

Federal Express and UPS (United Parcel Service) expose the difficulties integrators face when they grow in scale and scope. Federal Express started as an air carrier and is therefore licensed federally in the U.S.A. However UPS's origins were in road haulage which meant licensing was done state by state. With fifty bodies to satisfy in the USA alone UPS finds it more difficult to offer a consistent, flexible, standardised service than does Federal Express.

Aside from integrators, good examples of space-based or TAO global 3PL providers are the new 3PL companies spun off from parent railway, airline, trucking, or shipping lines: UP Logistics (Union Pacific – railway), Ryder Integrated Logistics (Ryder and LogiCorp – trucking), CSX Logistics (CSX – shipping line), P&O Global Logistics (P&O – shipping line), KLM (KLM – airline), and Mercantile (Maersk – shipping line) (Sheffi, 1990; Hastings, 1996a &1996b; Lieb & Randall, 1996a & 1996b).

Information-based global intermediaries do not own or control (to as large a degree as space-based intermediaries) the assets used to distribute the goods. These intermediaries have integrated vertically and horizontally through their control of information and through relationships with service providers and with similar intermediaries overseas. Examples of information-based global intermediaries are international freight forwarders, NVOCCs (non-vessel operating common carriers), consolidators, customs house brokers, and export management and trading companies (Wood, Barone, Murphy, & Wardlow, 1995). Freight forwarders are probably the most prominent information-based global intermediary and are often NVOCCs and customs house brokers in their own right (Pope & Thomchick, 1985; Sherwood & Burns, 1992; Murphy & Daley, 1995).

The differences between space-based and information-based intermediaries are not readily apparent. In Europe many large freight forwarders own or control extensive road vehicle networks though this is

uncommon in North America (Barrar & Davies, 1985; Bowman, 1994). Some forwarders are moving vertically into transport assets through aircraft ownership (Gillis, 1995). As there is no clear cut way of delineating global logistics providers the simplest way to classify both carriers and space and information-based intermediaries is by origin – what did the global logistics provider originally consider itself to be?

Even though their origins may differ many global logistics providers are moving towards a common goal. Browne devised a 2 x 2 matrix with one axis showing the defined portfolio of services - many or few - and the other axis indicating the extent of geographical presence. The intent was to show the propensity towards 'mega-carrier' status by global logistics firms through offering a large variety of services along with a global presence (Browne, 1992). Cummings defined a mega-carrier as, "...offering high value-added, fully integrated, comprehensive transportation and distribution services covering sea, land and air movements, together with all forms of logistics services along the distribution chain, including sophisticated inventory control and information systems to monitor and control distribution activities – or "total cargo management" (Cummings, 1992b).

In Browne's matrix such services would include handling a full range of shipment size; offering multimodal services, both singly and in combination; and making these services available nationally and internationally. Browne noted that no firm yet met this definition.

'MEGA-CARRIER' MATRIX

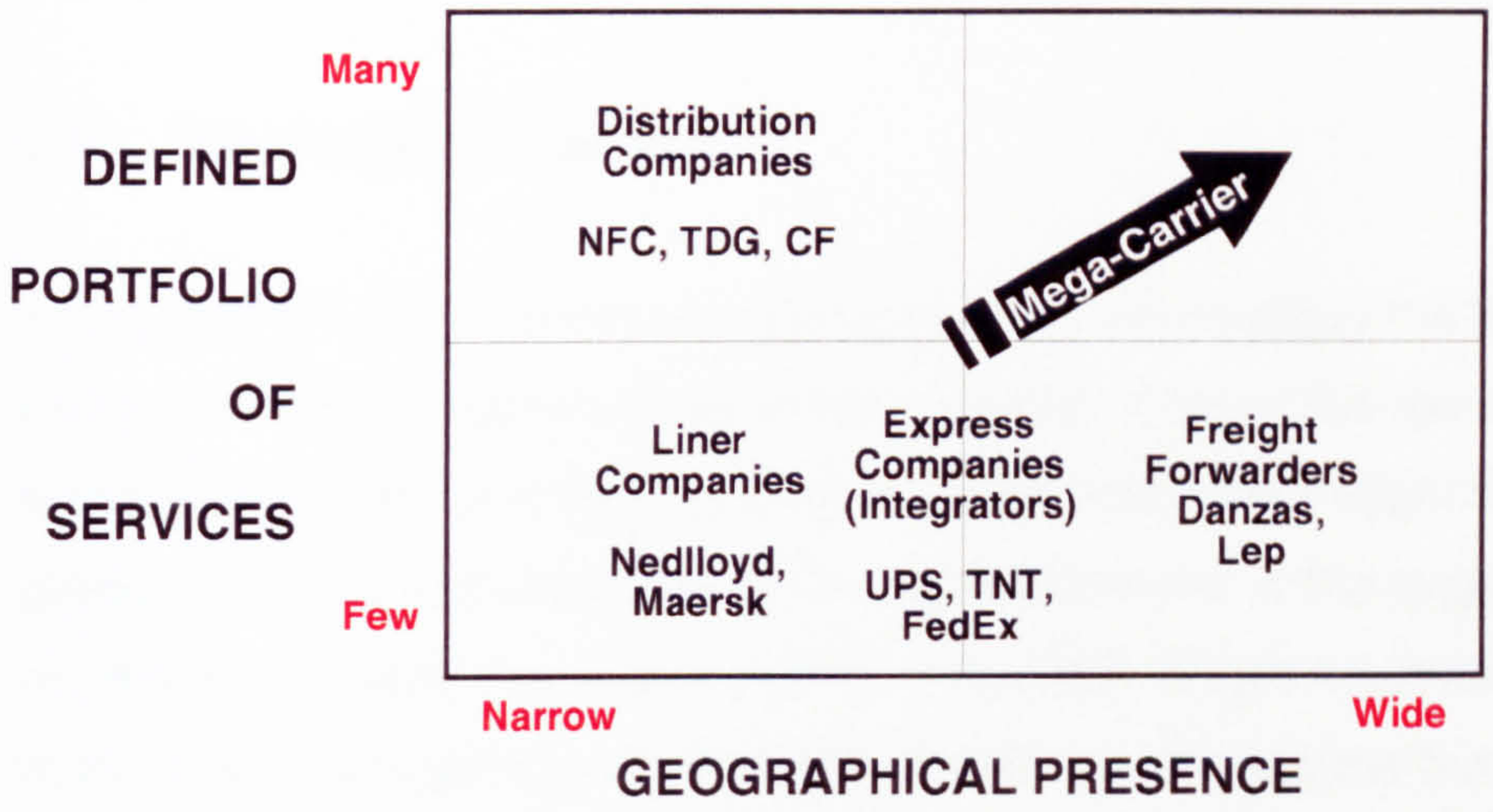


Figure 3-1

(Browne, 1992)

This is not an either/or matrix as the lines between intermediary and carrier are vague. Based on origin, forwarders have offered a global service (though not necessarily a global presence) but not a wide portfolio of services. The integrators also do not offer a wide portfolio of services (as of 1992) but their global services have been more limited on a geographic basis than forwarders because integrators tended to specialise on routes through a hub system. It is interesting to note that distribution companies, with their broad range of services, have been increasing their geographical presence by acquiring freight forwarders (Ford, 1993; Jacobs, 1993).

The concept of disintermediation is not foreign to global 3PL providers. Davies and Gray spoke of the overlap between freight forwarder and carrier and bypassing the intermediary many years ago (Davies & Gray, 1985). Disintermediation of traditional global logistics intermediaries can come from several directions: from line-haul carriers expanding their services (Trunick, 1993; Bowman, 1994); from integrators (Cooke, 1993; Gillis, 1995); from electronic middlemen (White, 1988; Davis & Davidson, 1991; Canna,

1992a); and even from shippers themselves (Damas, 1994; Bowman, 1995).

3.2.1 The freight forwarder

As probably the most prominent global logistics intermediary the freight forwarder is the corporate focus of this research. One of the few sources of a history of freight forwarding is from "Understanding the Freight Business" produced by Thomas Meadows & Co., at the time one of the largest multinational freight forwarders (1970). Reputedly freight forwarding started in the pubs and boarding house/hotels of east London several hundred years ago where the household effects of emigrants and sailors were held by landlords and 'forwarded' on to their final destination when required (Malkin, 1993; John & Wright, 1993). Murr suggests that freight forwarding began much earlier in Venice. In the 13th Century the *frachter* was a combination carrier, forwarder, and armed guard. He transported the merchant and his goods escorted by troops. In the 18th Century the *spediteur* (from which word came the English *expediter*) worked with counterparts all over Europe providing carrier and middleman services to shippers (Murr, 1979).

Academic literature directly involving freight forwarding has been rare. Prior to 1990 empirical research pertaining to freight forwarding often revolved around work done, individually and collectively, by Davies and Gray. This included Gray's PhD. thesis and subsequent article concerning modal choice for freight transport between the UK and continental Europe (Gray, 1980; Gray, 1981). This research indicated the importance of freight forwarders, especially in airfreight movements. Davies and Gray considered the international freight purchasing decision in which freight forwarders play a major part (Davies & Gray, 1980) while Davies analysed the relationship between the shipper and forwarder including possible future roles for each (Davies, 1981c). As noted earlier, such roles were based on

the principal versus agent dichotomy in freight forwarding existent in the 1970s. Barrar and Davies reported on a survey of freight forwarders which looked at the nature and size of the industry as well as the growth of computerisation (Barrar & Davies, 1985). They noted the importance of the forwarder managing the information flow. A major result of Pope and Thomchick's work with American-based foreign freight forwarders indicated that forwarders that owned or operated NVOCCs tended to be larger than those that did not (Pope & Thomchick, 1985).

With greater attention being paid to third party logistics, globalisation, and single source suppliers, academic interest in freight forwarders and other global 3PL intermediaries increased in the last decade. Murphy and Daley, in the earlier 1990s and in conjunction with Dalenberg, list a number of descriptions of freight forwarders by earlier writers. In several papers written over the last decade they described research involving freight forwarders (Murphy, Dalenberg, & Daley, 1991; Murphy, Daley & Dalenberg, 1991a, 1991b, 1991c, 1992, 1993; Murphy & Daley, 1994, 1995, 1996a, 1996b, 1999). In the 1993 and 1995 articles they noted that there had been little empirical research concerning freight forwarders and, in fact, had discovered only one empirical study – that of Pope and Thomchick, noted above. Similarly, in 1995, Leahy et al suggested there had been only four articles on modern (sic) third party logistics since 1990, none of which were articles by Murphy et al (Leahy, Murphy, & Poist, 1995).

In one of their earlier papers Murphy et al alluded to a survey in which 92% of responding American shippers said they utilised the services of a freight forwarder (Murphy, Daley, & Dalenberg, 1991b). They discovered that nearly 75% of all international shipments involved the services of a forwarder. In additional articles the same writers state that over 90% of both large and small U.S. shippers use (foreign) international freight forwarders for their global shipments (Murphy, Dalenberg, & Daley, 1991; Murphy, Daley, & Dalenberg, 1992, 1993). The message within most of these

articles was that such an important component of global logistics should not be ignored. These writers suggested prior research in global logistics neglected the intermediary especially when it came to carrier and route selection.

The following table summarises academic articles in which Murphy was involved in the 1990s:

FORWARDING LITERATURE INVOLVING MURPHY

Year	Title	Major concept concerning freight forwarders
1991	Analysing International Water Transportation: The Perspectives of Large U.S. Industrial Corporations	most of the responding firms made extensive use of freight forwarders
1991	Selecting Links and Nodes in International Transportation: An Intermediary's Perspective	freight forwarders look at carrier and port (link and node) selection differently from shippers
1992	Profiling International Freight Forwarders: A Benchmark	the characteristics of "pure" and "diversified" freight forwarders
1993	Doing Business in Global Markets: Perspectives of International Freight Forwarders	American freight forwarders' perceptions of the ease and difficulty of dealing with various countries
1994	Logistics Issues in International Sourcing: An Exploratory Study	the extent of freight forwarders' involvement in international sourcing
1995	International Freight Forwarders: Current Activities and Operational Issues	the functions of and the influences on freight forwarders
1995	Determinants of Successful Logistical Relationships: A Third-Party Provider Perspective	the perceptions of transport asset and non-transport asset owning 3PL providers
1996	International Freight Forwarder Perspectives on Electronic Data Interchange and Information Management Issues	usage of, benefits from, barriers to, and issues about EDI facing freight forwarders

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1996	A Preliminary Analysis of the Strategies of International Freight Forwarders	cluster freight forwarders by strategy: (largest to smallest) Defenders, Prospectors, Analysers, and Reactors
1998	Third-Party Logistics Usage: An Assessment of Propositions Based on Previous Research	asset versus non-asset based 3PL providers
1999	EDI Benefits and Barriers: Comparing International Freight Forwarders and their Customers	the perception of large int'l shippers concerning freight forwarders and EDI benefits and barriers

Table 3-1

In the 1992 article Murphy et al differentiate between pure and diversified forwarders. Pure forwarders focus on groupage of shipments moving via ocean while diversified forwarders offer other services, particularly airfreight consolidation. They also listed possible functions of these pure forwarders (Murphy, Daley, & Dalenberg, 1992). Özsomer et al classified the functions of freight forwarders under transportation services, trade services, and value-added services (Özsomer, A., Mitri, M., & Cavusgil, S., 1993). Amalgamating this categorisation with the lists of Murphy, Daley, and Dalenberg as well as those of other writers results in the following list of the functions performed by freight forwarders:

FUNCTIONS PERFORMED BY FREIGHT FORWARDERS

Transportation services	Trade services	Value-added services
negotiating freight rates	advising shipper as to terms of sale	export packing
make routing recommendations	ensure compliance of letters of credit	obtaining insurance
hazardous goods advice	obtaining and advising on overseas regulations	acting as consultant on export matters

continued on following page.....

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obtaining necessary space on vessel/aircraft/vehicle	preparing commercial invoices	legal advice & counselling about rules & regulations
paying freight charges	obtaining export licences and visas	project management
shipment groupage/consolidation	issuing export declarations for the shipper	management and information services
obtaining dock receipts	preparing certificates of origin	obtaining warehouse space
tracing and expediting shipments	obtaining and preparing consular invoices	customs brokerage: clearance, carnets, etc.
provide for transport from port to final destination	compiling ocean/air bills of lading	distribution
break bulk or deconsolidation	presenting documents to the bank	
	collecting and submitting money for shipments	

Figure 3-2

adapted from Davies, 1981; Murphy, Daley, & Dalenberg, 1992; Özsomer, Mitri, & Cavusgil, 1993; Baker, 1993; Bowman, 1994; Coyle, Bardi, & Langley, 1996

John and Wright further classified forwarders relative to their immediate competition as either:

1. specialised through geographic niches (by controlling the freight on certain routes) or product niches (by handling certain products such as art) (Muller, 1990; Thuermer, 1993; Bowman, 1994; Turney, 1997),
2. horizontally integrated by expanding internationally, or

3. vertically integrated by including warehousing, insurance, and similar ancillary operations in their menu of services (John & Wright, 1993).

In an earlier article they referred to the computerisation of the forwarding business over the prior quarter century as a shift from being a manpower-intensive industry to being an industry rooted in technology and knowledge skills (John & Wright, 1985).

In addition to the work by Murphy et al and the articles by authors already mentioned the 1990s saw much more empirical work directly involving freight forwarders. Heaver compared the development of customs administration in four countries from its original perception as a barrier and the progress of freight forwarders and the administration in eliminating this barrier to seamless logistics (Heaver, 1992). Matear and Gray examined the factors that may influence the transport decision of shippers and freight forwarders. These writers discovered differences in the factors between the two groups as well as differences between freight forwarders purchasing ocean and air services (Matear & Gray, 1993). Lillie and Sparks also considered the buying behaviour of global freight purchasers but concentrated on airfreight forwarders only. They noted that previous transportation research concerning the criteria used in the process of selecting a carrier focused solely on the shipper-carrier dyad and neglected the freight forwarder. Based on the buygrid model of Robinson, Faris, and Wind the research of Lillie and Sparks indicated that the dominant buyclass of freight forwarders was a modified re-buy (Lillie & Sparks, 1993). Özsomer et al moved further up the buying chain by investigating the forwarder selection process of shippers (Özsomer, Mitri, & Cavusgil, 1993). Khan looked at perceived service quality between airlines and their freight customers. These customers were airfreight forwarders and shippers (Khan, 1993). As freight forwarding moves from being manpower-intensive to knowledge-intensive so information systems have become all-important (John & Wright, 1985). Hardaker et al examined the extent by which

information technology has impacted the freight forwarding industry in the UK (Hardaker, Trick, & Sabki, 1994). Semeijn investigated the service priorities of global shippers and carriers. Though this writer neglected the intermediary in this research he suggested that shippers usually rely on freight forwarders (Semeijn, 1995). Several years later, in conjunction with Pearson, Semeijn re-considered freight forwarding services and included the intermediary in a similar piece of research (Pearson & Semeijn, 1998).

In the 1990s, conceptual work focusing on freight forwarding was as lean as empirical work in the 1980s. In the early 1990s Day recognised the possibility of carriers short-circuiting the traditional carrier-forwarder-shipper triadic relationship and attempting to reach the customer directly (Day, 1991). Sherwood and Burns also considered such a possibility in the ocean shipping trade when comparing freight forwarders and NVOCCs (Sherwood & Burns, 1992). When writing about motor freight 3PL services Crum et al suggested that demand for freight forwarder services might decline especially amongst small and medium sized shippers (Crum, Allen, & Ross, 1992). Bodendorf and Reinheimer focused on the relationship between airlines and airfreight forwarders when comparing the air cargo market with CRSs (computer reservation system used for inventorying and marketing airline seats) and the stock market (Bodendorf & Reinheimer, 1997). Jackson believes that freight forwarders, especially those that emphasise logistics services, have the best chance to become what he terms global lead logistics providers (GLLP) as they focus on adding value to the global supply chain and have more competencies than their competitors (Jackson, 1999).

While there is a scarcity of research *directly* involving freight forwarders there has been logistics research in areas important to the forwarder. Because forwarders are intermediaries between shippers and carriers and make freight transport decisions for their customers one important area is the decision choice concerning carrier and mode. A second area involves

shipment consolidation which is a major weapon in the freight forwarder's arsenal. Finally, as intermediaries, forwarders must develop and maintain relationships both up and down the distribution chain with shippers and carriers. In addition, most non-multinational forwarders offer the appearance of a global presence by co-operating with similar forwarders outside of their region. This results in a network of relationships between these forwarders which enables even the smaller firm to offer global services. Therefore, additional and relevant literature applicable to freight forwarding can be classified under three major areas:

1. selection of carriers and intermediaries (vendors)
2. consolidation or groupage of shipments
3. relationships between the intermediary and shippers, carriers, or other intermediaries.

3.2.2 Vendor selection

The selection of the appropriate mode and carrier is a crucial decision on the part of the intermediary. Hutt and Speh define organizational buying behaviour as:

> "the decision making process by which formal organizations establish the need for purchased products and services *and identify, evaluate and choose among alternative brands and suppliers*" (emphasis added) (Hutt & Speh, 1989).

As noted previously, with global distribution there are a greater variety of modes and routes along with the associated carriers and their schedules. At the same time the freight forwarder, as intermediary, must reconcile his method of selecting mode and carrier with the needs and desires of the shipper. Therefore the decision process for the forwarder is a complicated one.

Literature concerning vendor selection in logistics is broad though that portion focusing on carrier selection in a global context is much smaller. As would be expected there is little academic research aimed at the selection

of carriers by the intermediary or freight forwarder and, to the best of the author's knowledge, none involving the forwarder's selection of overseas agents.

The choice of a carrier often begins with the choice of mode. Slater considered three trade-offs: horizontal trade-offs between alternate transport modes; vertical trade-offs between elements *within* the mode such as palletising in a container rather than loading loose boxes; and lateral trade-offs amongst parties in the supply chain to reduce total channel costs such as the acceptance by one party of split shipments by different modes in order to reduce costs (Slater, 1979, 1982). Gray investigated modal choice between airfreight and surface LFL (less than full load) transport. In this work he developed a conceptual model of freight modal choice (Gray, 1980). In a subsequent article Gray examined the modal choice for urgent consignments between Britain and Western Europe and noted that the relationship shippers have with freight forwarders may affect their modal choice (Gray, 1981). Sheffi et al compared the various modal options based on total logistics costs. They created a model able to balance transport costs and inventory holding costs for each option. This would depend, of course, on the inter-changeability and stability of the various carriers' prices within each mode (Sheffi, Eskandari, & Koutsopoulos, 1986).

McGinnis discussed modal choice within freight transportation choice in his review of four models: the classical economic model; the inventory theoretic model; the trade-off model; and the constrained optimisation model. His reference to the inventory theoretic model devised by Baumol and Vinod considered the attempt to optimise modal choice through the trade-offs inherent in freight rates, speed, dependability (variance in speed), and enroute loss (McGinnis, 1989). However, Baumol and Vinod presumed that modal selection was only a low cost decision (Baumol & Vinod, 1970). Slater developed a trade-off model in which comparisons are made between mode, independent elements of the distribution system, and

shared costs amongst third parties (Slater, 1979; 1982). Jeffs and Hills categorised variables that might have influenced modal choice into six groups: customer requirements; product characteristics; company structure/organisation; government interventions; available transport facilities; and perceptions of the decision-maker him/herself. They concluded that it was the interactions and inter-relationships between these which determine modal choice. They also declared that the firm was the relevant unit of analysis in freight transport when discussing modal choice (Jeffs & Hills, 1990). Gentry and Farris ranked eight modal decision factors as follows: delivery date, cost, reliability, size, transit, item, damage, and services. This ranking differed considerably from a list of decision factors in the same article given for the carrier selection process (Gentry & Farris, 1992).

The processes in selecting a mode or a carrier may have more similarities than differences. Coulter et al suggest that the separation between the two decision processes is becoming much less distinct due to reduced regulation and increased transport options (Coulter, Darden, Coulter & Brown, 1989). McGinnis noted that prior to 1990 there had been twelve empirical studies into the selection determinants of carrier and/or mode in which seven explored carrier choice, two modal choice, two both carrier and modal choice, and one was directed at using in-house carriage (McGinnis, 1990). When writing about (domestic) transportation vendor selection Jeffs and Hills end their article by stating:

> "Freight flows are complex and so it is highly unlikely that a universal mode-choice model can ever be developed (Jeffs & Hills, 1990)."

Possibly, the greater complexities and options available in global transportation may ensure that such a perfect modal choice model is never created.

Bagchi used the Analytic Hierarchy Process (AHP) for carrier selection in a domestic situation because it is difficult to quantify all the criteria variables and therefore ranking models don't work well (Bagchi, 1988). Liberatore and Miller also used the Analytic Hierarchy Process for the combined transport carrier and mode selection decision. They divided the criteria into cost and qualitative sub-hierarchies. This would allow the shipper to trade off the two sub-hierarchies through weighted averaging techniques (Liberatore & Miller, 1995). Brooks showed a change in the 1980s in shippers' criteria for the selection of ocean carriers. Frequency of sailing and cost of service were the deterministic criteria in 1982 though this changed to transit time alone in 1989 (Brooks, 1990). The ranking list for carrier selection criteria from the research of Gentry and Farris, mentioned above, puts on-time delivery ahead of freight rates with criteria similar to other researchers subordinate (Gentry & Farris, 1992). Lambert et al also stayed within a single mode by considering the criteria used by shippers in selecting LTL (less than truckload) carriers (Lambert, Lewis & Stock, 1993a & 1993b). Murphy and Farris attempted to shift from a cost-based selection process to one based on time (Murphy & Farris, 1993).

The constrained optimisation model of McGinnis assists the decision-maker by minimising transportation rates subject to the constraints of product, distribution patterns and service needs. A number of variables make up these constraints:

1. reliability,
2. transit time,
3. over, short and damaged,
4. shipper market considerations (market competitiveness, outside market influences, customer's complaints, changing needs, user satisfaction, client deadline and satisfied customer's requirements),

5. carrier considerations (ability to carry large or unusual freight, financial health, condition and availability of equipment, reputation),
6. product characteristics (perishability, new product introduction and packaging requirements) (McGinnis, 1989).

The constrained optimisation model is a two-stage model wherein the transport decision maker minimises freight costs subject to satisfaction of various constraints. This theme was continued in another article by McGinnis in which he states:

> "...price becomes a major factor after service objectives have been met and in some instances may be the most important variable to the shipper (McGinnis, 1990)."

There is a flexibility with these variables which makes this model particularly suited to the complex vendor selection environment of freight forwarders.

Possibly due to the trend towards vendor reduction prevalent in the last few decades, Baker provided decision criteria that did not assist shippers in choosing a motor carrier but in eliminating carriers from a shipper's portfolio of freight vendors (Baker, 1984).

Unlike McGinnis' constrained optimisation model many vendor selection models and much research seems to balance freight rates *against* service variables rather than *with* them. This is often compounded by research, especially commercial, into carrier selection variables which generates widely varied criteria. For example, a survey conducted by GEIS (GE Information Systems) indicated that information systems were ranked third by shippers (after cost and reliability) (Browne, 1992). Ignoring the inherent bias of the sponsor of this research, shouldn't shippers be more interested in 'what information' these systems provide rather than the actual system? Why would the 'hardware' that makes available the information about the freight transaction be more important than many of the basic service criteria? Davies and Gunton noted this point when they suggested price is

critical in any freight purchase decision. They stated price is simply another layer in the hierarchy of needs (Maslow, 1943) which becomes a determining factor once certain service criteria have been met (Davies & Gunton, 1983). When shippers' needs have been satisfied at one level then they will wish their needs to be satisfied at higher levels. For example, a shipper may look first for transport providers whose routes offered meet the shipper's requirements and who have the equipment to move the freight. Then the shipper may short-list those carriers or forwarders by his perception of their service quality (i.e., speed, reliability, degree of loss or damage). Finally, the shipper may examine the costs involved.

Much of the literature is concerned with the differing perceptions in the selection process of both buyer and vendor. Abshire and Premeaux compared the perceptions of shippers and motor carriers using thirty-five variables. They found that most selection variables were not classified similarly between the two groups (Abshire & Premeaux, 1991a, 1991b). Matear and Grey based their research on forwarders (freight suppliers) in Ireland involved in sea and air transport. As may be noted on the following page perceptions between forwarders and shippers did differ (Matear & Grey, 1993). However, Murphy et al suggest that differences in perceptions may have been exaggerated and that shippers' and carriers' may give similar weight to the various selection factors (Murphy, Daley, & Hall, 1997).

The focus of many of these studies has been the organisation though survey methods, by reason of expediency, target one or a few decision makers. Whyte examined the transport decision maker individually and how these personal characteristics and the shipping firm's organisational characteristics affected the carrier selection (Whyte, 1992). This somewhat contradicted the result of Jeffs and Hills (1990) who, as noted above, declared the firm as the unit best employed for analysis of *modal* choice (as compared to vendor choice). Pearson and Semeijn took a more 'macro' approach by comparing the logistics service priorities of international

shippers in the United States and Europe. They noted there were few differences in upper-order priorities (Pearson & Semeijn, 1998). They also commented on the types of shipping in Europe suggesting within-EU shipping was comparable to domestic shipping except for communication and culture factors.

There are several articles involving the selection of a freight forwarder on the part of the shipper. Özsomer et al justify the use of an expert system tool (FREIGHT) in selecting a forwarder because of the development of sophisticated, multi service forwarders who have become third-party 'total logistics' providers. The process on which FREIGHT is based is called candidate evaluation (CE) which is similar to the analytic hierarchy process but includes heuristic reasoning techniques (Özsomer, Mitri, Cavusgil, & Tamer, 1993). Because of the practicalities involved in choosing a forwarder most articles in this area have been published in trade journals (Vidrick, 1988; Muller, 1990; Yokeum, 1990; Baker, 1993).

As mentioned in the preamble to this section research into carrier selection on the part of logistics intermediaries is scarce. Allen and Helferich discussed expert systems and their applications with an example of carrier selection by a freight forwarder. This involved daily decisions concerning carriers, rates and schedules and a greater consistency of decision making, better use of resources, and an increase in profits through a reduction in carrier charges to the forwarder (Allen & Helferich, 1990). Murphy, Daley and Dalenberg have carried out research directly concerning freight forwarders and vendor selection. This article deviates from other vendor selection articles by considering the selection of links and the nodes: links signifying the carriers and routes and nodes meaning the ports. The five most important criteria in the selection process of forwarders were equipment availability, shipment information, loss and damage performance, reliability and transportation costs. The fourth and fifth variables - reliability and freight cost - rate much higher with shippers.

Forwarders showed other internal differences in the selection of ports (Murphy, Daley & Dalenberg, 1991a).

Matear and Gray compared the criteria used by forwarders and shippers in the choice of sea and airfreight. They concluded that shippers and forwarders did use differing criteria in choosing a carrier and that the criteria in selecting air versus sea transportation services by forwarders also differed. They surmised that both shippers and forwarders were not as concerned with the route taken as they were with timeliness (of arrival) (Matear & Gray, 1993).

Lillie and Sparks examined the purchasing behaviour of airfreight forwarders. As mentioned previously they used the Buygrid model of Robinson, Faris and Wind (1967) which is comprised of three categories of purchase situations:

New task a need is perceived to be totally different from previous needs therefore much information is necessary in order to discover alternative ways of satisfying the new need and finding potential suppliers.

Modified re-buy purchasers feel it is to their advantage to continually re-evaluate alternatives. The writers use the terms 'in' and 'out' suppliers to describe vendors' position.

Straight re-buy routine repeat purchase

They concluded that forwarders exhibited modified re-buy behaviour. When speaking of shippers they refer to an article by Day (1991) in which they state that:

> "..although buyers may claim they seek a strategic partnership with a supplier, i.e. a straight re-buy situation, in reality their buyclass may be one of new task, as empirical research suggests that 'shippers prefer to seek individual specialists and enter into short term contracts' (Lillie & Sparks, 1993)."

This contradicts the trend of developing long-term relationships in which the straight re-buy is dominant. Ten years ago LaLonde and Masters concluded there was a strong trend amongst large shippers towards these long-term relationships and away from the transaction-based, 'new task' buying behaviour (LaLonde & Masters, 1990).

These last two articles bring up an important point for intermediaries and the selection process: How does the freight forwarder reconcile his own selection of carriers with the desires of the shipper? If, on the one hand, the forwarder enters into a long-term formal, contractual relationship with a shipper how does this equate with the forwarder's present modified re-buy situation in selecting carriers? And are these transactional relationships changing? Do shippers want a long or short-term relationship with a forwarder or forwarders compared to a similar relationship between shipper and carrier? Will forwarders change their transportation purchasing behaviour especially in light of the increased information provided by such high technology means as EDI or interorganisational information systems (IOSs)? Lillie and Sparks put this succinctly:

> "...It is interesting to speculate about whether the introduction of new technology, particularly EDI, will alter these relationships. By providing electronic links and increasing the opportunities for comparing operators, it will change the competitive situation and alter the buying behaviour of forwarders (Lillie & Sparks, 1993)."

These questions are best discussed in the context of the relationships formed by freight forwarders with shippers, carriers, and each other as well as the informational aspects of global logistics.

3.2.3 Consolidation

The key to profitability for the freight forwarder is through economies of scale. Khan suggested that consolidation and commissions are the two major sources of revenue for airfreight forwarders (Khan, 1993). As Alderson alluded in his definition of intermediaries, they "increase the

efficiency of the exchange process between producers and consumers by *aggregating transactions to create economies of scale and scope* (emphasis added) (Alderson, 1954)". By consolidating single shipments from various shippers (or many shipments from one shipper) together into a larger shipment or into a unit load device or container the forwarder obtains a price from the carrier that is lower per unit of weight or volume.

Consolidation is normally the term used for airfreight while groupage is the comparable term used for surface and ocean freight.

Hall's description of consolidation as combining shipments at different locations and different times suggested consolidating via inventory, within vehicles or in terminals (Hall, 1986). Min and Cooper developed this into three consolidation strategies:

spatial considers what nodes (points of delivery or pick-up) and links routes for delivery or pick-up) can be accrued in order to combine small into large shipments,

product considers combining different products together in one shipment in order to increase the size of the shipment sent to each customer,

temporal accumulates smaller orders over time in order to balance lower transport costs against customer service and higher inventory costs (Min & Cooper, 1990).

Sheffi also suggested consolidation could take place in time by building up larger loads; geographically by combining shipments; and within transport modes by including shipments to several nearby destinations (Sheffi, 1991).

Most of these descriptions and categorising of consolidation are based on domestic distribution and direct shipper consolidation. However, as may be noted, much of global distribution is carried out through an intermediary. Freight forwarders differ in their consolidation approach from the integrator, their nearest 'intermediary' competitor, by attempting to consolidate shipments spatially and temporally through offering varied but regular route

selection as well as product consolidation by combining different shippers' shipments. Integrators consolidate shipments via the hub system where goods are moved to a central hub and sorted before being shipped out to final destination. In the past in America Federal Express has used Memphis, Tennessee as its main hub; a shipment going from Los Angeles to San Francisco would travel many times the distance between those two cities and still be delivered overnight.

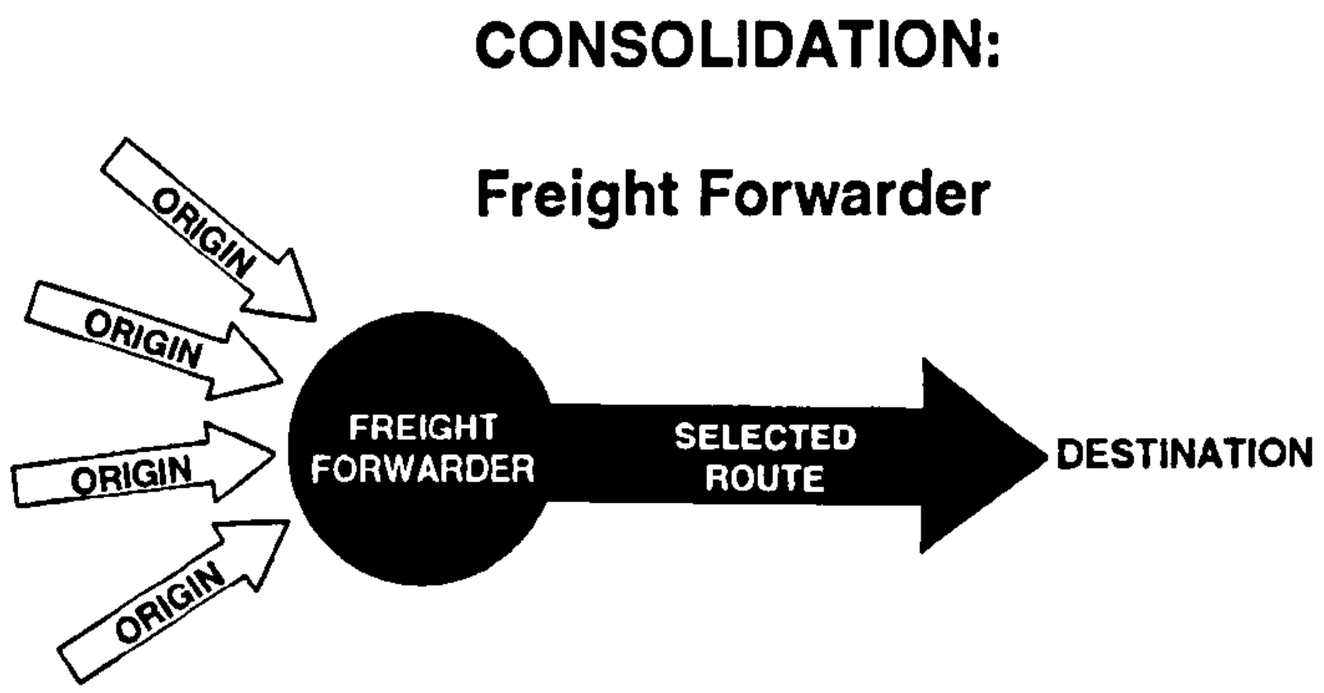


Figure 3-2

Integrators have consolidated individual shipments at their hub and over the origin and destination routes established to get these shipments to and from the hub. Forwarders consolidate their customers' shipments over selected routes to their destination. Both intermediaries offer time-delayed consolidation.

The literature stresses both domestic and outbound consolidation. Cooper examined the time and cost ramifications of various types of products and outbound consolidation approaches (Cooper, 1984). Hall's article mentioned previously expanded on the various consolidation strategies described and looked at the trade-off between lower transportation costs and higher inventory and operating costs (Hall, 1986). Min and Cooper carried out a comparative review of literature in two related areas: consolidation and backhauling which is the use of (nominally, road) carriers who would normally return empty (Min & Cooper, 1990). Continuing in the same mode Pooley and Stenger analysed more deeply (domestic) road consolidation which combines truckload and LTL (less than truckload) carriers (Pooley & Stenger, 1992).

As mentioned earlier Murphy et al used the term 'consolidation' as a defining word for forwarders; those forwarders that *grouped* shipments for ocean transport were considered 'pure' forwarders while those that *consolidated* shipments for air or road transport were 'diversified' forwarders (Murphy, Daley, & Dalenberg, 1992). In a survey of American-based freight forwarders Murphy and Daley noted that 89.6% of the respondents indicated they provided shipment consolidation. In addition, 91.8% of the freight forwarders responding said they offered break bulk services (Murphy & Daley, 1995).

In a trade periodical Phillips suggested international shippers must choose carefully amongst the LCL (less than container load) ocean lines, NVOs (non-vessel operators), consolidators or freight forwarders (Phillips, 1994). Many forwarders are NVOCCs (non-vessel operating common carriers) and, as such, compete with the ocean lines they use by consolidating shipments into full container loads, purchasing block space and obtaining volume discounts (Bowman, 1994).

Inbound consolidation is the other side of the coin. Buffa analysed the conditions that supported using an inbound consolidation strategy while Bagchi and Davis created a model to analyse inbound freight consolidation (Buffa, 1987; Bagchi & Davis, 1988). Russell and Cooper also developed a model which incorporated quantity discounts and carrier rate breaks as well (Russell & Cooper, 1992). Bookbinder and Barkhouse conceptualised an information system capable of handling the consolidations of both inbound and outbound shipments (Bookbinder & Barkhouse, 1993; Barkhouse & Bookbinder, 1993).

There are two key terms linked with consolidation: multimodal and intermodality. The term *multimodal operator* is often used to describe a firm which offers services in two or more modes. For example, the CF Group offers trucking (Consolidated Freightways), airfreight (Emery Worldwide) and sea freight services (Con-Way Intermodal). Some LTL (less than truckload) firms are forming alliances with ocean freight providers (Bradley, 1992b) or with railroads offering intermodal railroad truck (IRT) service where the trucking firm provides the drayage (short-haul pick-up and delivery) function and the railroad provides the line-haul (long haul) function (Harper & Evers, 1992). Bukold has divided the multimodal transport operators (MTOs) which form the link between shippers and combined transport (CT) suppliers into three groups:

1. forwarders and trucking companies
2. shipping lines
3. medium-sized MTOs which specialise in combined transport (Bukold, 1993).

Multimodal operators may have horizontally integrated across modes in order to capture traffic which has escaped the operators' original modal beginnings and to benefit from intermodal cross advantages.

Intermodality, as defined by McNulty, is:

> "the reciprocal interrelation between separate modes of carriage through mutual action to improve the operating efficiency and enhance the end service products of the participating modes (McNulty, 1974)."

Intermodality is the generic process based on the relationship between the modes; multimodal is the resulting provision of the (occasionally unrelated) services. Freight forwarders are intimately involved in providing intermodal services. White speaks of the flexibility that forwarders can offer in comparison to the inter/multimodal operator. If a forwarder is also a non-vessel owning multimodal transport operator (NVO-MTO or NVOCC) he can offer variations in routing, mode and timing that competitors cannot match as quickly (White, 1988).

3.2.4 Relationships

The third interconnected theme involving freight forwarders is the relationships formed by forwarders with other parties. These relationships – alliances or partnerships – are of three types:

1. those with shippers and, by extension, with importers,
2. those with carriers and other service providers and,
3. those with other freight forwarders (as agents).

In his research examining the global logistics partnership negotiation process Rinehart classified global logistics partnerships based on Porter's five forces model as:

1. *Common value contributing partners* - those competitors at the same level as the global firm who form a partnership for mutual benefit. e.g. Ford and Mazda,
2. *Supply partners* - those companies who supply the firm,
3. *Customer and distribution partners* - customers and distributors of the firm's product,
4. *Third-party storage partners,*

5. *Third-party information and physical movement partners*

(Rinehart, 1992),

One should note the separation of service and product suppliers as well as the split between third-party logistics vendors. These vendors often find themselves in the position of intermediaries between buyer and seller. As an intermediary providing a service the forwarder buys from vendors and sells to customers as do almost all commercial organisations. However, the intermediary must position himself to create value in his offering via his relationships with both parties as well as to avoid being by-passed by a direct link between customer and vendor.

When discussing shipper-carrier or shipper-forwarder relationships one of the trends is outsourcing. Rao and Young defined outsourcing in logistics as referring:

> "...to the practice of a shipper of awarding exclusive contract to a service provider for handling transportation, warehousing or other logistics functions, singly or in combination, on a segment of its business. ...used when the activities were previously handled within the shipper's logistics organisation." (Rao and Young, 1994)

They identified five factors in the decision of shippers to divest global logistics services to third-parties versus keeping them in-house:

1. *centrality of the logistics functions to core competency*: control of expertise, security and focusing on core activities;
2. *risk liability and control*: quality assurance;
3. *operating cost/service trade-offs*: consistency, downsizing and consolidation within shippers' firms;
4. *information and communications systems*: complexity and synergy;
5. *market relationships*: trend toward value-added services and reduction in number of vendor relationships

When Schary and Coakley coined the term *centrifugal* to describe the forces leading towards outsourcing to third parties they included buying in specialised expertise and flexibility in handling changes in organisational resources as two additional motivational forces (Schary & Coakley, 1991).

In a trade journal Cooke described the air freight forwarders' move into third-party distribution as a shift away from the damaging competition inflicted by integrators. First into deferred shipments (e.g. two or more day delivery) and, when the integrators followed, developing truck networks for overnight delivery. When integrators moved "up the weight scale and down the time scale" (Bowman, 1994) forwarders moved into third-party distribution (Cooke, 1993). However, Cooke felt only large forwarders had the resources to make such a move.

The importance of asset-ownership in the relationships between third-party companies and shippers is important. Muller concluded shippers believed those companies that owned their own assets (asset-based) were biased towards using these assets. Conversely, data-based third-party vendors were not as highly regarded by some shippers because of the lack of financial stability imparted by trains, boats, planes or trucks (Muller, 1992). Sheffi classified such third-party companies as non-transportation asset owning and transportation asset owning (NTAO and TAO) and felt the NTAO company could forge better relationships with both shippers and carriers (Sheffi, 1990).

Forwarder/shipper relationships

The freight forwarder may act as an *agent* for the shipper, procuring firms to transport, store, or handle the goods. The shipper will then enter into the contractual relationship with the providers of these services. However, as has become more common in the past few decades, the forwarder will have a formal contract with the shipper and act as the *principal* with the carrier-

providers (Baker, 1993). This contractual association can foster a stronger, longer-term relationship.

In the early 1980s Davies described the relationships between shipper and forwarder as taking three forms:

Type 1: the *traditional approach* in which the shipping manager outsourced the exporting function to the freight forwarder and took on the liaison role;

Type 2: the *forward integrated exporter* in which many, sometimes all, of the freight forwarding functions were taken over by the exporter; and

Type 3: the *reverse integrated exporter* who has outsourced the shipping department's functions and built a strong partnership with the freight forwarder (Davies, 1981c).

Davies suggested that Type 1 relationships, which made up the majority of shipper-forwarder relationships, were being superseded by the Type 2 and 3 relationships. However, while Type 3 relationships have multiplied in the past twenty years, the number of Type 2 relationships has remained relatively small. Bowman suggests that 'self-forwarding shippers' (Type 2 relationships) are those who might concentrate on a limited number of markets (Bowman, 1995). As with many buyer-vendor relationships today, shippers are increasingly likely to outsource exporting functions; build stronger, longer-term relationships with a smaller number of logistics services vendors; and "stick to their knitting". Consequently one might expect Type 3 relationships to grow in number and importance relative to Type 2 relationships (McKnight, Meynial, & Snow, 1997). However, the traditional Type 1 relationship still dominates (Cooke, 1993; Murphy & Daley, 1996b).

The traditional relationship between forwarder and exporter may become less important. Historically, freight forwarding has been export orientated. However, the advent of supply chain management has brought the importer

to the forefront and the growth of 'pull' demand chains rather than 'push' supply chains. Freight forwarders have had to learn to adapt to the prominence of importers (Lewis, 1999).

A major factor affecting the relationship between forwarder and shipper is the mode of transport used. Davies and Gray noted that shippers seeking international airfreight transportation were more likely to contact an airfreight forwarder than shippers intending to use surface freight. Those shippers needing surface freight would look for a carrier specific to the route required (Davies & Gray, 1980).

Forwarder/carrier relationships

While shippers have been reducing the number of logistics vendors with which they deal and building stronger partnerships with those that remain, so have freight forwarders been reducing the number of carriers with which they deal (Day, 1991; Lillie & Sparks, 1993; Turney, 1997). It has been suggested that large airfreight shippers are driving their freight forwarders into more transparent relationships involving the shipper, forwarder, and airline (Turney, 1997). Crum and Allen noted that shippers and carriers have been realising the benefits to closer and longer-term relationships – perhaps to the possible exclusion of the intermediary (Crum & Allen, 1991). These changes between shippers and carriers may also be factors driving forwarders into closer relationships with their suppliers (Day, 1991).

In their 1993 article Lillie and Sparks concentrated on the buying behaviour of airfreight forwarders. They separated the forwarder's buying decision into shipper-vendor selection for routine orders and for new orders on the part of their shipper-customers. From this they noted that more carriers were considered when carrying out new orders than when fulfilling routine orders (Lillie & Sparks, 1993).

Lillie and Sparks also suggested that the introduction of information technology such as EDI and IOS (interorganisational information systems) might alter these relationships (Lillie & Sparks, 1993). Often driven by the demand for EDI, electronic hierarchies often lead to closer, tighter relationships. However, electronic markets (epitomised by the Internet) could lead to standardised relationships in which customers and suppliers link directly bypassing present intermediaries (Davis & Davidson, 1991; Browne, 1992; Holland & Lockett, 1993). Disintermediation is a fear faced by many intermediaries in the present rush towards electronic supply chains. Bodendorf and Reinheimer compared a potential electronic air cargo market with the stock market and with CRSs (Computer Reservation Systems such as American Airlines' *SABRE*). They suggested that there were four differences between an electronic air cargo market and the stock market: airlines are always sellers and forwarders are always buyers unlike the changing roles in the stock market; there is time pressure in the air cargo market due to the perishability of space; stocks are homogenous whereas shipments are not; and there is a tendency towards oligopoly in the air cargo market as not all airlines land at all airports (Bodendorf & Reinheimer, 1997). The writers compared the three electronic markets across five dimensions: the market relationships, the neutrality of the controlling player(s), the homogeneity of the goods, the centralisation of the control, and control of the access to the system. They suggested an electronic air cargo market would have multiple buyers though relatively few sellers, neutral and decentralised control, low homogeneous goods, and open, though controlled, access to the system.

Gibson, Sink and Mundy linked the diverse relationships between shipper and carrier with the vendor selection process of the shipper. They devised a model showing a relationship continuum from price-dominant, short-term, transaction-based to quality-dominant, long-term, partnership-based. The extremes are characterised by:

1. *Transaction Based Philosophy*: characterised by price sensitivity, little emphasis on quality or reducing number of carriers used, and arms length, short-term relationships, and
2. *Relationship Based Philosophy*: in which quality is paramount and the relationship is characterised by strong evaluation criteria and long-term tightly bound alliances (Gibson, Sink & Mundy, 1993).

The writers pointed out that few shipper-carrier relationships fit these two extremes. As can be noted in the following model their research indicated a connection between carrier selection and the relationship between the shipper and carrier.

A BASIC MODEL OF TRANSPORTATION PURCHASING STRATEGY

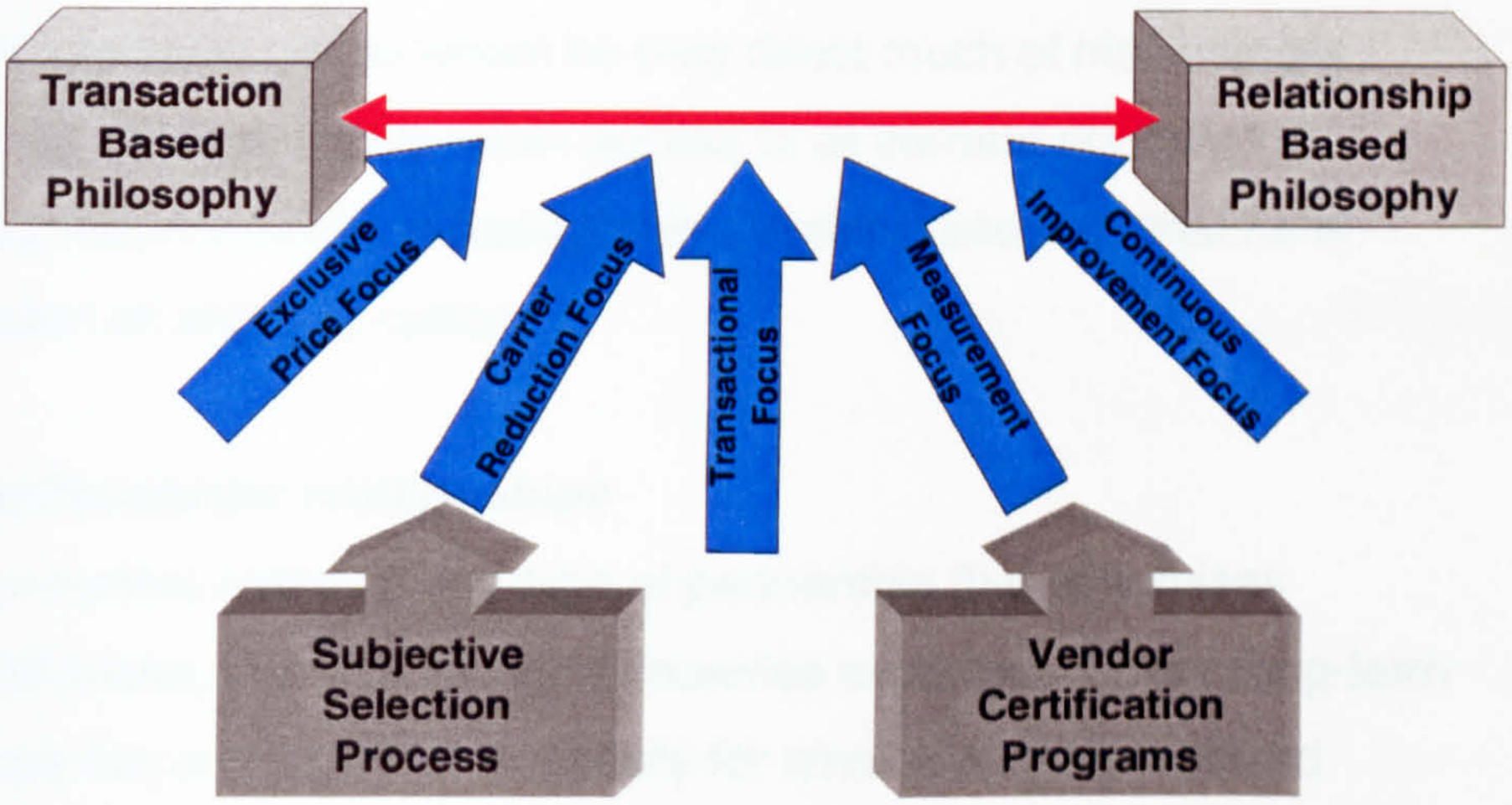


Figure 3-3

(adapted from Gibson, B., Sink, H., and Mundy, R., (1993))

Forwarders are seeking to establish value-added partnerships with shippers who, in turn, may be considering reducing the number of forwarders with whom they deal. Similarly, forwarders are also seeking stronger ties with their carrier-vendors. To the airline the forwarder is often considered its marketing arm and bulwark against the integrator who offers door-to-door

service versus the airline's airport-to-airport service. However, the partnership formed between forwarder and air carrier is tenuous as often the allies' information systems are not integrated and neither carrier will accept total responsibility. Bradley adds that "airlines and forwarders continually bicker – they haven't learnt the partnership concept yet" (Bradley, 1992c). Day suggests that carrier-shipper partnerships could threaten freight forwarders unless forwarders form similar partnerships with carriers. On the one hand forwarders are being driven to form partnerships with carriers by the same forces pulling shippers and carriers together. On the other hand these carriers often compete directly with the forwarders with whom they have this contentious relationship (Day, 1991).

While attempting to build some sort of strategic alliance with certain carriers the forwarder may not seek to reduce the number with which he deals. Certainly there will be key carrier-vendors with whom the forwarder will have a strong relationship and to whom he may direct much of his business. However, he would probably retain access to all carriers not only for competitive reasons but to indicate to his shipper-customers that he is keeping open all shipping options.

Forwarder/forwarder relationships

Finally, forwarders maintain one type of partnership that epitomises strategic alliances; that with similar companies overseas. These long-term relationships are a competitive necessity for small and medium-sized forwarders who cannot support a global infrastructure of their own. These overseas agents act as the local representative of the originating forwarder, receiving shipments and arranging delivery. Even large intermediaries grow via agency networks; DHL grew organically for many years before expanding into France via over twenty partnership agreements. These relationships do not exist simply to obtain economies of scale through building a cost-effective global infrastructure. They also offer the appearance of a global logistics provider to compete with the international

giants. For example, a number of smaller forwarders have formed Hi-Tech Forwarder Network (HTFN) and are connected through a sophisticated global information system (Trunick, 1993).

An additional development with commercial relationships is the importance of informal relationships. Lassar and Zinn carried out research on the importance of formal contracts in logistics channel relationships. They believe that informality in a commercial relationship maintains flexibility, builds trust between the parties involved, and allows each to evaluate the abilities of the other party for more formal relationships (Lassar & Zinn, 1995). Freight forwarders cultivate such informal relationships especially with carriers and overseas agents. A number of interviews with freight forwarders in Canada indicated that respondents disliked electronic means of receiving carrier information as it reduced the personal (or, more likely, vocal via telephone) link enjoyed in a more informal relationship (Ford, 1994).

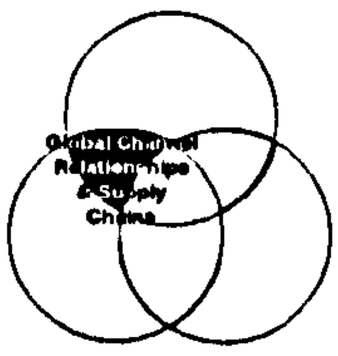
Therefore the forwarder must maintain and nurture three relational interfaces: those with the shipper-customer, those with the carrier-vendor, and those with similar forwarder-agents overseas. Only the last relationship is relatively unchanging.

To bring together the three sub-themes of vendor selection, consolidation, and relationships there is a strong inter-connection between the relationship with and selection of carriers and the forwarder's consolidation of freight. The largest freight forwarders enjoy economies of scale through sheer number of shipments. Thus, they are able to schedule regular, repetitive consolidated shipments with carriers and negotiate competitive prices from them. Most, if not all, of their customers' freight will move through these forwarder 'pipelines'. Such arrangements are commonly set up many months in advance. The scale economies from sheer quantity are augmented by the greater lead-time available to the forwarder and

consequently, more consistent routing and a lower cost structure. These long-term arrangements with carriers should result in a more formal, contractual or straight re-buy relationship between forwarder and carrier.

Conversely, the small forwarder, unless he controls a geographic or product niche, cannot obtain these economies of scale and cannot depend on most of his customers' shipments being shipped through this pipeline under his control. Putting together a non-temporal consolidated shipment becomes more difficult. His strength comes from being flexible in carrier selection and obtaining the best freight rate possible while meeting his customers' service parameters, usually on a shipment by shipment basis. Therefore, the small forwarder would shop around for the best combination of price and service from carriers. This is an example of new task buying behaviour (Robinson, Faris and Wind, 1967). Therefore, the consolidation operations employed by the forwarder affects the selection of his carrier-vendors and is manifested in the relationship he has with these carriers.

3.3 Global channel relationships and supply chains



As stated earlier, intra-company trade is highly significant. Trade within global supply chains makes up approximately two-thirds of American exports and one-half of all trade between OECD countries (Julius, 1990). Bowersox referred to several experts who estimated that during the late 1980s global business transactions grew at a rate three times that typical of domestic economies world-wide (Bowersox, 1993). Cooper suggested that companies are expanding internationally because of the globalisation of markets, cheaper communications, the removal of barriers to trade and foreign investment, potential economies of scale in business, and innovation in logistics (Cooper, 1993a). However, Zukerman believes that many disrupters of global supply chains still exist and include non-tariff

barriers such as national regulations and standards, import and export compliance, and financial and invoicing requirements (Zuckerman, 1999).

For a domestic firm the decision to expand overseas and enter another market becomes one of channel integration. At the extremes the firm can perform all the overseas marketing and distribution functions itself or it can outsource these functions to middlemen and end-buyers. In the late 1980s and early 1990s Klein, in conjunction with Roth and Frazier, took a normative approach to explain the channel integration choice of firms in international markets (Klein, 1989; Klein, Frazier, & Roth, 1990; Klein & Roth, 1993). Their question became to what extent do firms forward integrate to enter foreign markets and why. They based their research on Transaction Cost Theory as originally expounded by Coase. The basic premise of Coase's rendering of TCT is that the firm will internalise those activities which it is able to perform at a lower cost and outsource to the market those activities where other providers have an advantage (Coase, 1937). Ranging from outsourcing of services to in-house fulfilment, the four different integration choices of Klein et al were: *market exchange* in which the goods are sold to independent merchants in the foreign country; *intermediate exchange* in which independent organisations (i.e., commission agents) perform the sales function; *exporting* in which the foreign market is served directly from the home country of the firm; and establishing a *wholly owned foreign sales subsidiary* (Klein, Frazier, & Roth, 1990). Akhter also took a TCA (Transaction Cost Analysis) approach in examining foreign market entry strategies involving direct marketing (Akhter, 1996) while Peng and Ilinitch used TCA to investigate the exporting firm's decision to use export intermediaries (Peng & Ilinitch, 1998).

Competition on a global level, the international economic climate, and achieving a "think global, act local" strategy have put pressure on international companies. Houlihan remarked that a company's

vulnerability to global change should be considered in the context of its external position in the global supply chain and its own internal supply system (Houlihan, 1985). The further a company is from the end-users of its products, the greater are the swings in demand it faces. These swings are amplified in the company's own internal system. Levy reinforces this conclusion by suggesting that lead times are longer and inventory levels higher in global supply chains (Levy, 1997). This could result in a "bullwhip" effect in which order fluctuation is amplified further up or down the supply chain.

Cooper asserted the key product variable affecting a company's global logistics strategy was value density. Low value density goods such as cement would require a local logistics system whereas high value density articles such as diamonds and computer chips would need a global solution (Cooper, 1994). In addition, Cooper said that global logistics strategies based on the concept of postponement would take four forms:

1. *unicentric* in which production and distribution was fully centralised (i.e., Marlboro duty free cigarettes),
2. *bundled manufacturing* in which customisation of the product takes place at the last possible stage (i.e., Sony televisions),
3. *deferred assembly* in which the final configuration takes place at a warehouse (i.e., Compaq computers), and
4. *deferred packaging* in which the labelling and packing take place at a warehouse (i.e., shampoos and other cosmetic products).

Participants in these world-wide supply chains require global solutions. Harrington quotes John Williford, President of Menlo Logistics in Redwood City, California, who said, "..(that the) customer is driving (other parties) towards global situations" (Harrington, 1998). Rao and Young suggested five key factors drive the decision to outsource global logistics services: centrality of the logistics functions to the company's core competencies,

control and risk liability, operational trade-offs between cost and service, information and communication systems, and market relationships (Rao & Young, 1994). Jackson concludes that the European logistics industry will continue to evolve in offering global supply chain solutions (Jackson, 1999). He also believes users want global logistics partners rather than domestic or regional providers.

Central to Browne's premise concerning freight mega-carriers was the necessity of being global (Browne, 1992). In order to provide a global solution a 3PL provider must offer a wide geographic presence. Browne also noted that a freight mega-carrier should offer a wide variety of logistics services including multimodal transportation. In order to achieve mega-carrier status current transport operators and 3PL firms need to build on their information system expertise and forge alliances with firms having competencies unavailable to them. In the 1997 Key Note Report on Freight Forwarding the editor, S. Howitt, appears to agree with Browne. He suggests that those firms that can offer a global service *and* a wide range of logistics services will flourish but at the expense of middle-sized firms who try to be all things to all customers. The small operators will be left to provide niche services to a limited customer base (Howitt, 1997).

Cummings suggested that 3PL providers who wish to become global should move from a domestic base with overseas partners as agents to a multinational 3PL firm by replacing the agents with owned operations (Cummings, 1992a). As NTAO (non-transport asset owning) 3PL firms the larger forwarders can spread globally more easily than shipping lines and airlines because there is no need to acquire airplanes and ships. Freight forwarders must invest in information technology solutions and, sometimes, ground facilities instead.

3.4 Governance: markets and hierarchies

The boundaries of firms appear to have been changing over the past few decades. With the increasing relevance and importance of supply chain management practices, information technology, and new organisational forms through mergers, alliances, and joint ventures it has become increasingly difficult to define where the firm's functions, influences, and control start and end (Konsynski, 1993; Wilson, 1995; Poppo & Zenger, 1998). What defines the boundary of a firm is whether or not a firm should vertically integrate certain processes. The degree to which the firm *internalises* these processes (performs them in-house) defines its boundary (Anderson & Weitz, 1986).

The boundary of a firm is derived from and the firm is delineated by the organisation of the resources of the firm in order to carry out these processes. Williamson considered firms and markets as alternative modes of organisation or governance (Williamson, 1996). In pure markets almost all processes are out-sourced to the market; the firm becomes a virtual organisation. At the other extreme, the vertically integrated firm pulls many of its processes in-house. Examples near these extremes could be, at the market end, the newer 'dot.com' retailers or the clothing firm, Benetton, and at the hierarchical firm end, Ford, which, in the 1950s, was heavily vertically integrated from its Baton Rouge steel plant to distribution of its automobiles.

The organisational arrangement or corporate framework that administers this 'make or buy' decision is the governance structure. Firms and markets are merely alternative governance structures that differ in their approach to the costs of transacting with outside providers. Market governance structures consider the transaction costs of dealing with these

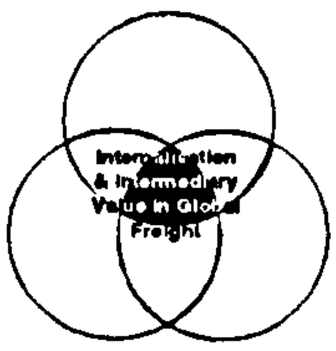
providers to be low whereas many firms, as hierarchical governance structures, perceive these costs to be higher. Under certain conditions, the costs of carrying out economic exchange in a market may exceed the costs of organising the same exchange within a firm. Once that point is reached the firm will pull the previously out-sourced process back in-house (Coase, 1937).

Originally, the governance decision – market or hierarchy – was an either/or decision (Williamson, 1985). Over time, it has come to be accepted as a continuum in which other hybrid governance structures exist. Thorelli criticised Transaction Cost Analysis as practised in the mid-1980s because it 'polarised attention and ignored the wide variety of interfirm relationships that lie between the extremes of market and hierarchy" (Thorelli, 1986). Dwyer and Oh concur, describing this grey area as the "largely neglected middle ground" between market and hierarchy. The most prominent advocate of Transaction Cost Theory, Oliver Williamson, seemed to agree when he ultimately accepted hybrid forms of governance (Williamson, 1991). The study of the relationships between the buyer and seller of logistics services by Dahlstrom et al specifically focused on the midrange relationships (Dahlstrom, McNeilly, & and Speh, 1996).

Governance and the market/hierarchy continuum have had their academic applications and conceptualisation in third party logistics services, especially over the past decade. Ellram attempted to develop a theory of supply chain management (SCM) by tying in TCA (Ellram, 1991). She considered SCM to be comprised of certain types of relationships between acquisition and transaction. These relational exchanges correspond to the TCT extremes of in-house (hierarchy) and out-source (market). Specifically taking a TCA approach, Aertsen sought to discover the conditions under which organisations might contract out their physical distribution functions (Aertsen, 1993). In their conceptual work on logistics

research frameworks, New and Payne questioned using TCT in formulating presumed causal links (New & Payne, 1995). As a normative method of analysis, these writers noted TCA often has had prescriptive applications. In the first phase of their work into the procurement of logistics services, Dahlstrom et al used TCA to ascertain the conditions that might create market, hierarchical, or hybrid purchasing agreements (Dahlstrom, McNeilly, & Speh, 1996). Loader argued that TCA focuses on the dyadic relationship between two firms only rather than on the multiple relationships supposedly inherent in a supply chain (Loader, 1997). He refers to the work of Zajac and Olsen in which they suggested TCA considers only the governance decisions of the single firm. Zajac and Olsen promote the concept of transaction value (as opposed to transaction cost) so that all mutually dependent supply chain member firms can benefit (Zajac & Olsen, 1993).

3.5 The substantive locus: Internalisation and the value of the intermediary in global freight



Where does the intermediary fit in a world of markets or hierarchies? Intermediaries perform functions that could be performed in-house by a vertically integrated firm or purchased from the intermediary by a market-oriented firm. When dealing with service intermediaries what makes some purchasers choose to 'buy' these mediating functions and others to 'make' them? And, just as important, what exactly do purchasers 'buy' or 'make'? By *internalising* or incorporating the intermediary functions within its own boundaries (i.e., by making it in-house) the purchaser has elected to deal directly with the primary vendors. Bypassing the intermediary implies internalising the functions of the intermediary. As discussed earlier, two of the major mediating functions that would be internalised by the purchaser are the provision of a wide choice of primary vendors while offering a

reduction in the exchange relationships necessary for the purchaser to form with these vendors[1].

Applying this to global logistics, the freight forwarder offers the shipper the opportunity to select from a variety of primary carriers while, at the same time, reducing the various buyer-seller relationships the shipper would need to maintain with these carriers. Instead of keeping up a number of relationships with potential carriers the shipper need only associate with one or a few freight forwarders. This information/relationship dichotomy is one of the primary functions of an intermediary.

Customers for global logistics services may often perceive intermediaries as being synonymous with carriers. Therefore, freight forwarders must offer these shippers either greater value than carriers (through, nominally, the aforementioned information/relationship dichotomy), lower *overall* cost (in which the costs of transacting with intermediaries versus primary vendors play an important part), or both (Rao, Stenger, & Young, 1988). Differentiation, as a singular competitive strategy defined by Porter, may play a minor role (Porter, 1980). As noted in Chapter 1, cost reduction is often considered a surrogate of value creation. Aside from the information/ relationship dichotomy, value is also contributed through the additional benefits, usually related to the provision of door-to-door service, offered by the freight forwarder. Such benefits include the trade and value-added services previously listed on page 36.

As will be examined in greater depth in following chapters, Transaction Cost Theory and its application, Transaction Cost Analysis, play an important part in examining cost reduction. Transaction costs are the costs of governing, administering, and co-ordinating exchanges with outside parties.

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[1] Note the definition of an intermediary provided earlier as 'one who reduces or eliminates the need for a buyer to form exchange relationships, ad hoc or relational, with a number of suppliers by concentrating the buyer's need for information at the buyer interface and expanding the buyer's requirement for choice or selection at the supplier interface'.

One aspect of TCT often overlooked by researchers is the significance of the costs of production. It is assumed that buyers go to the market to obtain a good or service because they can purchase it outside their environs at a lower cost than they could produce it themselves. However, if the costs of transacting with the market prove too onerous, purchasers may find that the total costs of producing the good or service in-house may be less than the purchase cost plus the market transaction costs (see graphic below). The purchaser is expected to select a governance structure that would minimise the *sum* of production and transaction costs (Williamson, 1981). It should also be noted that some researchers believe integrated or in-house production bears its own internal transaction costs between hierarchical units (Johanson & Mattsson, 1987; Walker & Poppo, 1991; Alexander & Young, 1996). When creating their Service Process Analysis (SPA) matrix, Tinnila and Vepsalainen noted that there was a balance between length of channel or governance structure (in which number of units and linkages determine length) and service type (in which complexity and product sophistication determine type) such that this sum of production and transaction costs was minimised (Tinnila & Vepsalainen, 1995).

MAKE OR BUY: THE GOVERNANCE DECISION

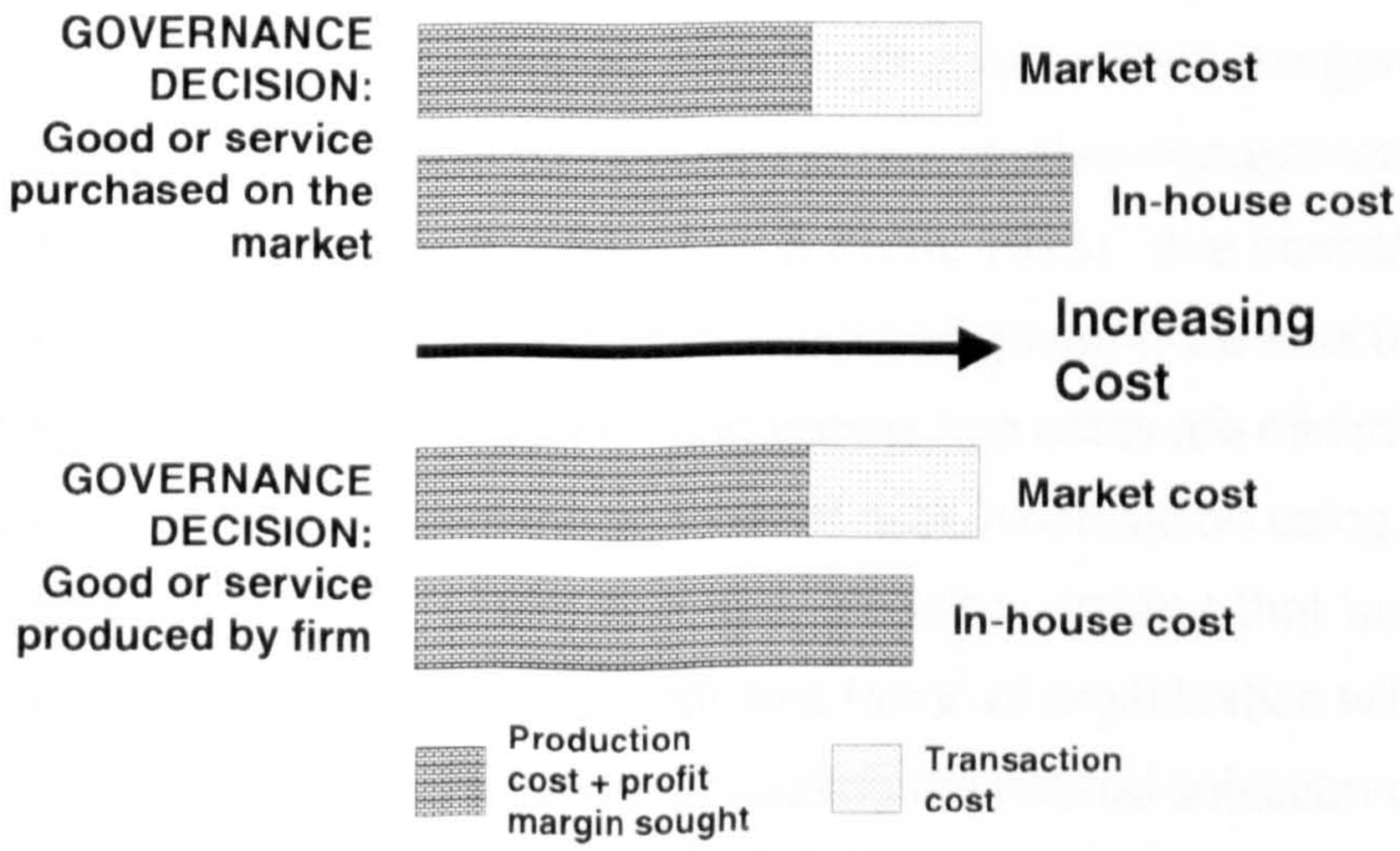


Figure 3-4

Benjamin and Wigand said that the price for which an article is sold consists of three (interdependent) elements: the costs of producing the article, the profit margin sought, and the costs of co-ordination, governance, or administration (Benjamin & Wigand, 1995). Production cost advantages may exist in the market because market providers of goods and services likely possess economies of scale and/or scope unavailable to potential purchasers. Scale economies are achieved by expanding the production and sale of one product or service; scope economies are achieved by sharing costs across two or more product lines (Panzar & Willig, 1981; Mathur & Kenyon, 1997).

For the freight forwarder, production cost advantages from scale economies come mainly through consolidation. By consolidating smaller shipments the freight forwarder is able to offer the shipper prices similar to or better than the primary carrier while including additional features, especially those related to door-to-door services. Production cost advantages from scope economies come from these additional services. The preparation of export and import documentation can be combined, information and communication costs reduced, and financial arrangements merged.

The theoretical base of Transaction Cost economics (TCE) is essentially normative in that it 'examines what ought to be and what organisations and individuals ought to do' as opposed to prescriptive research which explains and predicts phenomena (Mentzer & Kahn, 1995). In a normative model such as TCA, firms are expected to choose governance structures so that the combination of production and transaction costs are minimised. Buckley and Chapman interpret the concept of cost minimisation using Darwin's theory of evolution. In simple terms, efficiency dictates that 'survivors survive' – economically more efficient forms of organisation will overcome those less efficient! However, in relating the natural selection of species to cost minimisation and governance structure, they distinguish between 'blind' (occurring in biological evolution) and 'deliberate' (rational, deliberate, and

purposeful) development. They also suggest that it is difficult in the real world to compare the alternatives of market versus internalisation or integration as only one outcome ever arises. If there are two possible outcomes, ***A*** and ***B***, with corresponding transaction costs, ***X*** and ***Y***, then:

if ***X > Y***, *outcome **B** will prevail and,*
if ***Y > X***, *outcome **A** will prevail*

In hindsight we would know only ***A(X)*** or ***B(Y)***, not both, therefore, it becomes impossible to suggest what the correct outcome should be (Buckley & Chapman, 1997).

One key concept missing in much of the literature on transaction and production costs is managerial perception of these costs versus actual measurement of the costs. A major element of Buckley and Chapman's work was the perception of these costs. Perceived costs for alternative market and hierarchical structures likely exist prior to the decision on governance being made. Thus, these perceived transaction and production costs can be compared which, as the authors say, is 'theoretically satisfactory' (Buckley & Chapman, 1997). Buckley and Chapman do ask if these costs can be perceived in retrospect (after the governance structure has been settled) or if they can be perceived in prospect (in anticipation of possible change). The former suggests normative research; the latter, prescriptive. It is possible that managers of integrated companies are continually considering, consciously or not, the perceived governing, co-ordinating, or administrative costs of trading with outside providers and vice versa. This comparison of perceived costs can be measured, albeit usually in relative terms only.

In summary, the intermediary performs certain functions for the buyer, centred on offering lower transaction costs *in total* by reducing the number of exchange relationships the buyer must maintain with primary vendors.

Instead of incurring transaction costs with ***M*** primary vendors so that the total transaction costs become ***a x M*** (where ***a*** is the average cost of transacting with each primary vendor) the buyer elects to deal with ***N*** intermediaries (with average transaction cost of ***b***) and a total transaction cost of ***b x N***. In general, the transaction cost of dealing with the intermediary or intermediaries should be less than the transaction cost of dealing with a number of primary vendors for those buyers who use intermediaries.

$$b \times N < a \times M$$

Usually, the buyer would do business with fewer intermediaries than primary vendors [$N < M$] so that, even if the average transaction cost of dealing with intermediaries were higher [$b > a$], the sum *total* cost of transaction would still be lower.

In addition, the intermediary may offer some sort of production cost advantage to the buyer. Disregarding the cost of the transaction, it is expected that buyers will go to the market to purchase a good or service only if the price is less than the cost of making the good or service in-house. Production cost advantages come from scale or scope economies. As with transaction costs it is managerial perception of these production cost advantages that is important. If the buyer perceives the intermediary as holding a production cost advantage over the primary vendor(s) it is likely he will use the intermediary. However, because of transaction costs, the converse may not hold. If the buyer perceives the primary vendor as holding a production cost advantage over the intermediary the buyer may or may not trade with the primary vendor. The transaction costs of dealing with both the potential suppliers of the good or service must also be taken into account.

Applying this to global freight transportation, the freight forwarder becomes the intermediary, the shipper becomes the buyer, and the airline or shipping line becomes the primary vendor. Initially disregarding production costs, in mathematical terms, for shippers who use freight forwarders, the sum total of the perceived transaction costs of using a forwarder (or forwarders) should be less than or equal to the sum total of the perceived transaction costs avoided of dealing with a number of carriers:

$$\sum_{i=1}^{k} T_{SF_i} \leq \sum_{i=1}^{n} T'_{SC_i}$$

where:

T	=	Total perceived transaction costs between the shipper and a freight forwarder or a carrier.
T'	=	Total perceived transaction costs avoided (i.e., the transaction costs that the shipper might incur if he dealt with a party other than the party with whom he already deals).
$S, F,$ & C	=	Shipper, forwarder, and carrier (i.e., T_{sf} represents the perceived transaction costs between shipper and forwarder
k	=	The number of freight forwarders with which the exporter trades.
n	=	The number of airlines with which the exporter has avoided trading by using a freight forwarder.
T_{SF_i}	=	The transaction costs between the shipper and the ith freight forwarder.
$\sum_{i=1}^{k} T_{SF_i}$	=	The sum of the transaction costs between the shipper and k forwarders.
T'_{SC_i}	=	The transaction costs avoided between the shipper and the ith carrier (i.e., the perceived transaction costs that the shipper might incur if he dealt directly with carrier i).
$\sum_{i=1}^{n} T'_{SC_i}$	=	The sum of the transaction costs avoided between the shipper and n carriers.

This is a more refined model of the previous working equation:

$$b \times N < a \times M$$

Production cost advantages may be expected to accrue to the freight forwarder as intermediary. Therefore, the left side of the equation benefits from the deduction of production cost advantages and the equation becomes:

$$\sum_{i=1}^{k} T_{SF_i} - \sum_{i=1}^{m} (P_F - P_C)_i \leq \sum_{i=1}^{n} T'_{SC_i}$$

where, in addition to the above nomenclature:

P	=	Perceived production cost.
$_F$ & $_C$	=	Forwarder and carrier (i.e., P_f and P_c are the production costs of the forwarder and carrier as perceived by the shipper)
m	=	The number of extant production costs.
$(P_F - P_C)_i$	=	The ith production cost advantage a forwarder may hold over the carrier. Production cost *dis*advantages would be negative.
$\sum_{i=1}^{m} (P_F - P_C)_i$	=	The sum of the m production cost advantages of the forwarder (i.e., the total production cost advantage (if any) of the forwarder as perceived by the shipper)

For shippers who presently use freight forwarders, the sum total of the perceived transaction costs of using the forwarder (or forwarders) *minus* the total perceived production cost advantages (if any) offered by the forwarder(s) should be less than or equal to the sum total of the perceived transaction costs avoided (by using forwarders rather than dealing directly with carriers).

Likely, for those shippers who do deal directly with airlines and shipping lines on a regular basis, either:

1. the perceived potential transaction costs of using freight forwarders are greater than the perceived present transaction costs of using carriers,
2. the perceived production cost advantages of freight forwarders are non-existent or negative (in the carrier's favour) or,
3. both.

As suggested earlier, exact measurements of transaction costs, perceived or not, are difficult to acquire. It is easier and probably 'theoretically satisfactory' to measure the transaction costs of dealing with two parties relative to each other.

3.6 Summary

This chapter has explored the literature surrounding the provision of global third party logistics services, global supply chains and exchange relationships, and governance structures. This has resulted in a focus on the freight forwarder as a third party logistics intermediary in global freight transportation. Even though there has been some talk of the impending death of the forwarder industry many shippers still use them. In recent years carriers, both air and ocean, have approached shippers directly attempting to by-pass the freight forwarder.

The preceding also suggests that the relative costs of transacting with freight forwarders and a variety of air and ocean carriers may offer an explanation as to the continued existence and, indeed, development of the freight forwarder/global 3PL industry. By reducing the shipper's perceived cost of transacting with a multitude of air and ocean carriers the freight forwarder may ensure his own future. These savings in transaction costs are compounded by the cost savings from production cost advantages

usually offered by out-sourced vendors. In the case of freight forwarders, production cost benefits revolve around scope and scale economies such as consolidation advantages and supplementary services.

On a generic level the research question becomes one that asks how the freight forwarder contributes value to shippers through cost reduction. By comparing the perceived transaction and production costs shippers attribute to forwarders relative to carriers, this dissertation seeks to show that the reduction of *total* costs of an exchange is an appropriate contributor of value. In addition, certain factors, internal and external to the participants and to the exchange, affect the shipper's perception of these costs and may influence the governance structure chosen. These will be developed in Chapters 6 through 9 from the qualitative analysis of semi-structured interviews conducted with shippers, carriers, and freight forwarders.

The next chapter looks at the research approach and the philosophies that drive the research. The methods chosen are derived from the research approach and philosophy espoused. The chapters subsequent to that will present an overview of this methodology as well as an in-depth exploration of the methods taken followed by the analyses and results.

Chapter 4: THE RESEARCH APPROACH

4.1 Introduction

Research is driven by a desire to know, understand, or explain some phenomena. For every researcher, beneath this acquired knowledge or understanding, lies a set of basic beliefs or assumptions that defines the "world" as he perceives it as well as his relationship to that world and its constituent parts (Guba & Lincoln, 1994). How the researcher appreciates and comprehends reality as well as the position he takes relative to it contributes to the paradigm under which his research takes place. This chapter presents a review of the various philosophical perspectives available and the paradigm or set of beliefs adopted by the writer as well as the reasons behind their adoption. In addition, it suggests a research strategy best suited to the paradigm chosen followed by a research design and appropriate methods. It is structured as follows:

4.2 Philosophical perspectives: Determining the paradigm

Paradigms have been defined in several ways. Guba and Lincoln provided a generic description:

"A paradigm may be viewed as a set of basic beliefs (or metaphysics) that deals with ultimates or first principles. It represents a worldview that defines, for its holder, the nature of the "world," the individual's place in it, and the range of possible relationships to that world and its parts, as, for example, cosmologies and theologies do." (Guba & Lincoln, 1994)

whereas Kuhn specifically targeted social and natural scientists in 1970 when he described paradigms as "the entire constellation of beliefs, values, techniques, and so on, shared by the members of a given scientific community" (Kuhn, 1970). Mears-Young and Jackson agree suggesting that these beliefs, ideas, and assumptions guide the scientific activity of this community (Mears-Young & Jackson, 1997).

Three types of basic, underlying beliefs or elements make up one's paradigm (Denzin & Lincoln, 1994c). The first is ontological assumptions, the second is epistemological assumptions, while the third is methodological choice. The first are those assumptions about reality which, as Burrell and Morgan say, are "assumptions which concern the very essence of the phenomenon under investigation" (Burrell & Morgan, 1979). An ontological question would ask what is the nature or form of reality and, consequently, what can be known about it? If one assumes a real world exists "out there" then one can discover how things fit and how they work (Guba & Lincoln, 1994). Blaikie described ontology as "'...the science or study of being' .....(it) refers to the claims or assumptions that a particular approach to social enquiry makes about the nature of social reality – claims about what exists, what it looks like, what units make it up, and how these units interact with each other" (Blaikie, 1993). Hughes succinctly refers to ontological assumptions as those concerning "what kind of things are there in the world?" (Hughes, 1990).

Approaches to social enquiry are often divided into two groups in terms of their ontological assumptions. These camps are *realist* or *constructivist*. Realists assume that social reality exists independently of our conception of it, that this reality is ordered or structured, and that this structure can be observed. Constructivists believe that there is no reality other than the socially created constructs we use when speaking of reality (Pettigrew, 1996). Social reality becomes, therefore, something produced or socially constructed by the participants in that society (Blaikie, 1993). Often this

construct is embedded in the language used by that society (Hughes, 1990). Philosophies that espouse a realist ontology include positivism, critical rationalism, and realism. Those that adopt a constructivist ontology include interpretivism, critical theory, structuration theory, and feminism.

The second element that makes up one's paradigm is epistemological assumptions. These are views one holds about knowledge and how one understands the world and communicates this knowledge to others. The word, *epistemology*, comes from the Greek word 'episteme'. The ancient Greeks grouped knowledge into two types: *doxa* or 'that which was believed to be true' and *episteme* or 'that which was known to be true'. Science became the process of inquiry which turned doxa into episteme (Hirschheim, 1992). An epistemological question would ask what is the nature of the relationship between the inquirer and that which can be known (Guba & Lincoln, 1994)? Blaikie described epistemology as "'the theory or science of the method or grounds of knowledge' ....(which) refers to the claims or assumptions made about the ways in which it is possible to gain knowledge of this reality, whatever it is understood to be..." (Blaikie, 1993). As a theory of knowledge, epistemology is concerned with what criteria must be satisfied in order that knowledge not be construed as mere beliefs. An important element of epistemology is questions about what to count as facts. Again, Hughes defines these type of assumptions concisely by asking "what is the character of our knowledge of the world (Hughes, 1990)?

As with ontology, a dualism exists with epistemology (Burrell & Morgan, 1979; Gioia & Pitre, 1990). A *determinist* stance would be held by objectivists who presume people are conditioned by the society which exists independently of them. Therefore, as is commonly assumed with the natural sciences, human behaviour would be predictable – specific situations will cause specific reactions. A determinist stance would entail perceiving a hard, external, objective reality; associating the social

sciences with the natural sciences; and taking a nomothetic approach to research which would follow the traditional 'scientific' course in which the researcher is detached from the subject matter and aims to quantify findings through testing (Burrell & Morgan, 1979). Research driven by a determinist epistemology would attempt to objectively acquire knowledge through a cumulative process. As with research in the natural sciences, determinists would seek to understand what is true and what is false and to identify laws, regularities, and causalities. Such research would also presuppose a realist ontology as the researcher would assume reality exists independently of his awareness of it – such a reality does not need his belief in it in order to exist.

The second epistemological stance – and one that opposes determinism strongly – is *subjectivism*. Subjectivists believe people are not 'scientifically' predictable because they have free will. *Voluntarism*, as this is known, suggests that society is produced by people acting in accordance with their own perceptions and beliefs (Mears-Young & Jackson, 1997). Researchers taking a subjectivist stance are immersed in the socially constructed world that is under examination. This social world is created by the subjective experiences of the individuals involved. Knowledge acquired is dependent on understanding the point of view of those people who create the reality therefore subjectivists can only understand the world through these people's perceptions. Knowledge then becomes situation specific and should not be generalised to other circumstances. Deriving laws or regularities becomes impossible. Burrell and Morgan suggest that a subjectivist epistemology goes hand in glove with a *nominalist* ontology (Burrell & Morgan, 1979). Similar to constructivism, a nominalist view assumes reality is the result of people's own perception and cannot exist without them. Nominalists believe that there is no structure to the social world other than what they create themselves.

These two opposing epistemological stances – determinist and subjectivist – have been likened to outside and inside inquiry (Evered & Louis, 1991). An outside perspective would be objective, as an onlooker, context free, and based on measurement and logic. Categorisation of results would routinely be a priori. The aim of the inquiry would be universality or generalisability. In contrast, an inside or subjectivist perspective would entail immersion in the subject, be relevant to that situation only, and be based on depth and perception. The researcher would take on the role of an actor in the research interpreting meaning. Categorisation would emerge through this interaction between researcher and researched.

Methodology, the third element making up one's paradigm originates from the ontological and epistemological stances favoured by the researcher. The methodology chosen focuses on how we acquire knowledge about the world. Blaikie described methodology as "...the analysis of how research should or does proceed ... includes discussions of how theories are generated and tested, what kind of logic is used, what criteria they have to satisfy, what theories look like, and how particular theoretical perspectives can be related to particular research problems" (Blaikie, 1993). Methods are the procedures or techniques used to gather and analyse the data. The method or methods often depend on the sometimes conflicting goals of creating or testing theory. Where the researcher is testing a hypothesis experimental or manipulative methods are often chosen which may involve verification or falsification of the hypothesis using quantitative means (Guba & Lincoln, 1994). Where the researcher is building a theory hermeneutic or dialectic methods based on qualitative data may be chosen. Quantitative methods emphasise the measurement and analysis of causal relationships between variables, not processes. On the other hand, qualitative methods place the emphasis on processes and meanings which are not as rigorously measured or examined as with quantitative research methods (Denzin & Lincoln, 1994a). The former focuses on facts while the latter focuses on meanings (Easterby-Smith, Thorpe, & Lowe,

1991). Often, with determinists, qualitative methods are considered merely an adjunct to quantitative methods (Seaker, Waller, & Dunn, 1993).

To summarise, the researcher must make a fundamental choice between different and contrasting ontological positions (realist versus constructionist), epistemological positions (determinist/outside versus subjectivist/inside), and methodologies (involving quantitative or qualitative methods). Blaikie suggests asking three questions about the research in order to choose one's philosophical position (Blaikie, 1993):

1. What is the nature of the research project?
2. Is the intention to build theory or to test theory?
3. What is the relevance of meaning, purpose, and interpretation?

This research project is being carried out in a select and restricted environment of global freight with limited access to participants in order to discover the perceptions of managers within freight forwarders, airlines and shipping lines, and shippers. The questions asked seek to discover explanation of a phenomenon – why does the freight forwarder/intermediary exist – rather than to simply explore the area. Moreover, the project looks for reason not causality. The project intends to create theory (and extend Transaction Cost Theory) as well as test it. Finally, the need to clarify managers' perceptions of cost and value increases the importance of meaning and interpretation.

4.2.1 Dualism in the social sciences

These sets of ontological, epistemological, and methodological assumptions highlight the differences amongst paradigms. The pairing of a realist ontology in which reality is viewed as independent and separate and a determinist epistemology in which an objective stance is taken is usually indicative of the *positivist* or post-positivist paradigm. Positivism is an established paradigm and, by far, the paradigm of choice in logistics research (Mentzer & Kahn, 1995). It was first formalised by August Comte

in the mid 19th Century to whom we owe the description of causality and the relationship between facts:

> "We have no knowledge of anything but phenomena; and our knowledge of phenomena is relative not absolute. We know not the essence, nor the real mode of production, of any fact, but only its relations to other facts in the way of succession or similitude. These relations are constant; that is, always the same in the same circumstances. The constant resemblances which link phenomena together, and the constant sequences which unit them as antecedent and consequent, are termed their laws. The laws of phenomena are all we know respecting them. Their essential nature, and their ultimate causes, either efficient or final, are unknown and inscrutable to us" (Comte, 1866).

Positivism has dominated scientific research for most of the 20th Century. Guba and Lincoln described positivism's ontology as 'naïve realism (in which) knowledge of the "way things are" is conventionally summarised (resulting in a desire to discover) cause-effect laws' (Guba & Lincoln, 1994). They also described positivism's epistemology as 'dualist/objectivist (in which) the investigator (is independent of) the investigated' and suggested the most likely methodology would be 'experimental or manipulative (involving) verification of hypotheses (and using) chiefly quantitative methods'. With post-positivism, Popper suggested attempting to falsify one's hypotheses rather than verify them (Popper, 1959).

As mentioned above, theory development, testing, and application in logistics research has tended to follow the positivist paradigm (Mentzer & Kahn, 1995). The following framework depicts their approach to research:

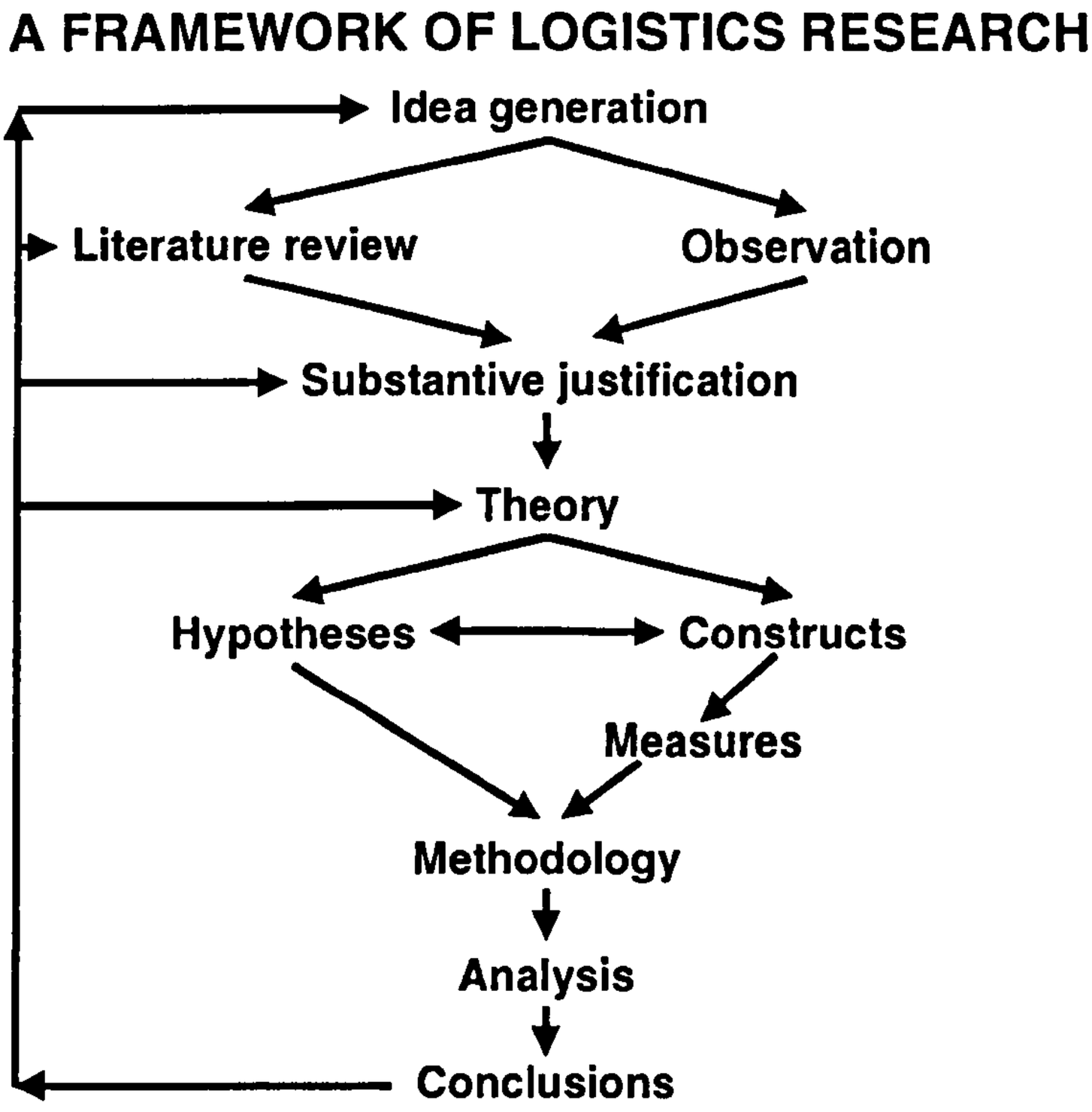


Figure 4-1

(Mentzer & Kahn, 1995)

The concept of testing a theory derived from literature and observation with operationalised constructs is characteristic of the positivist paradigm. Mentzer and Kahn suggest a sequential procedure in which idea generation leads to substantive justification for the research. Through a process of logical deduction, theories are derived from an existing theory base from which emerge hypotheses that are conceptually linked to the theory to be tested. These hypotheses take two forms: with descriptive hypotheses the association between variables is inferred whereas with causal hypotheses the determination of one variable by another is inferred. The constructs are abstract, non-observable, concepts while the hypotheses are empirically testable statements about non-observable constructs. The process of conversion from non-observable constructs to observable variables that allow the hypotheses to be tested is the operationalisation of the constructs or *correspondence*. The methodology becomes a research design wherein data collection procedures, sample

size and composition, measures, and data analysis procedures are determined. Issues of validity – internal validity, construct validity, external validity and statistical conclusion validity – are paramount (Mentzer & Kahn, 1995).

Mears-Young and Jackson criticised the dominance of the realist ontology in logistics research for its focus on systems and sub-systems. They suggested subjectivists would find the realist ontological assumptions in most logistics research to be fundamentally flawed. Subjectivists assume people act freely based on their own beliefs and are not, therefore, predictable. Consequently, they believe the best way to understand this social world is by immersing oneself rather than attempting to quantify it (Mears-Young & Jackson, 1997). These writers also suggest logistics research must move beyond functionalism in order to overcome its problems of acceptance.

The following four tables summarise the various assumptions made by adherents of the two major paradigms. Paradigms are often best explained in relation to each other. While positivism has dominated over the last century other paradigms such as interpretivism and phenomenology have arisen, especially in the social sciences. It should be noted that while most scientists and philosophers place positivism at one extreme they are divided on the other pole. Some suggest phenomenology or interpretivism are but intermediate points between positivism and idealism though others place them at the opposite extreme (Easterby-Smith, Thorpe, & Lowe, 1991; Stiles, 1995).

Table 4-1 on the next page contrasts the philosophical assumptions of the positivist and interpretivism paradigms. The major difference is in the objectivity of the researcher. With positivism this is of paramount concern: the researcher, his methods, and the reality observed are all separated. With interpretivism, the researcher is immersed in his work.

Table 4-2 on the succeeding page compares the resultant research strategies that normally ensue from these two paradigms. The major difference here is the position and relationship of theory to data. With positivism, theory drives the collection of data. The categorisation of the (prospective) data is usually devised in advance of fieldwork. The hypotheses are derived from existing theory and literature and the resultant theory is tested. With interpretivism, the theory emerges from the data obtained. Theory is more likely to be created rather than tested with this paradigm. Positivists attempt to explain or predict phenomena whereas interpretivists seek to explore, understand, and describe.

Table 4-3 on the succeeding page contrasts certain features of the methods commonly used by positivists and interpretivists. Qualitative and quantitative data are used by both adherents though different emphases and methods apply. Positivists usually work with quantitative data analysed via statistical means. To many positivists, qualitative data might be construed as noise or colour or something to be quantified such as occurs with content analysis. To interpretivists qualitative data is fundamental, whether it be in textual or non-textual form. It has been suggested that quantitative research (as opposed to positivist) offers breadth but not depth while qualitative research (as opposed to interpretivist) offers depth but over a narrower range (Patton, 1990).

Key to the appreciation of much qualitative work is the use of triangulation – multiple methods or data sources – which assumes that the weaknesses inherent in any single analytical method will be compensated by the strengths in another (Rohner, 1977; Jick, 1979; Mason, 1994; Morse, 1994). A researcher in qualitative data has been referred to as a "bricoleur" (Fr: 'Jack of all trades' or professional 'do-it-yourselfer') (Denzin & Lincoln, 1994). Bricolage becomes, therefore, the practice of carrying out a variety of tasks or methods.

CONTRASTING PHILOSOPHICAL ASSUMPTIONS

PHILOSOPHICAL ASSUMPTIONS	PARADIGM	
	Positivism	**Interpretivism**
Key idea	*The world exists externally and its properties should be measured through objective methods, rather than being inferred subjectively through sensation, reflection, or intuition.*	*The world and reality are not objective and exterior but are socially constructed and given meaning by people. The task of the social scientist should not be to gather facts and measure how often certain patterns occur, but to appreciate the different constructions and meanings that people place upon their experience.*
Ontology	*"...assumes that social reality exists independently of the observer and the activities of social science, that this reality is ordered, and that these uniformities can be observed and explained (i.e., cause and effect)"*	*"...assumes that social reality is produced and reproduced by social actors. It is a pre-interpreted, inter-subjective world of cultural objects, meanings, and social institutions"*
Epistemology	*"Knowledge is seen to be derived from sensory experience by means of experimental or comparative analysis, and concepts and generalisations are shorthand summaries of particular observations"*	*"Knowledge is seen to be derived from everyday concepts and meanings. The social researcher enters the everyday social world in order to grasp the socially constructed meanings, and then reconstructs these meanings in social scientific language. At one level, these latter accounts are regarded as re-descriptions of everyday accounts; at another level they are developed into theories"* *(Anti-positivism)*

Table 4-1

adapted from: Burrell & Morgan, 1979; Blaikie, 1993; Guba & Lincoln, 1994; Stiles, 1995

CONTRASTING FEATURES OF THE RESEARCH STRATEGIES

FEATURES OF RESEARCH STRATEGY	PARADIGM	
	Positivism	**Interpretivism**
Research should	• *Focus on facts.* • *Look for causality and fundamental laws.* • *Reduce phenomena to simplest elements.* • *Formulate hypotheses and then test them.*	• *Focus on meanings.* • *Try to understand what is happening.* • *Look at the totality of each situation.* • *Develop ideas through induction from data.*
Research strategy	*Data is theory driven (hypothetico-deductive).* *Induction/deduction*	*Theory evolves from observation.* *Abduction/induction*
Aim of inquiry	• *To search for regularities and test in order to predict and control theoretical concerns.* • *To explain and/or predict.*	• *To describe and explain in order to diagnose and understand theoretical concerns.* • *To understand.*
Role of researcher	*Onlooker (outsider)*	*Actor (insider)*
Hypothesis position	*Theory driven.*	*Theory emergent.*
Source of categories	*A priori*	*Interactively emergent*

Table 4-2

adapted from: Burrell & Morgan, 1979; Taylor & Bogdan, 1984; Gioia & Pitre, 1990; Patton, 1990; Evered & Louis, 1991; Blaikie, 1993; May, 1993; Guba & Lincoln, 1994; Lacity & Janson, 1994; Mentzer & Kahn, 1995; Stiles, 1995; Mentzer & Flint, 1997

CONTRASTING FEATURES OF METHODS

FEATURES OF METHODS	PARADIGM	
	Positivism	**Interpretivism**
Preferred methods	• *Operationalising concepts so they can be measured.* • *Talking large samples.* • *Quantitative methods.*	• *Using multiple methods to establish different views.* • *Small samples investigated in depth or over time.* • *Qualitative methods.*
Approach to quantitative data	*Statistical analysis*	*Triangulation, data matrix formulation, verification, testing.*
Approach to qualitative data	*May consider it "as a set of interfering variables that need controlling, known as noise in the data, or other controlled variables which are experimentally set up in order to seek for cause and effect relationships".* *Content analysis – quantifying qualitative data.*	*Hermeneutical or dialectical analysis*
Attention to respondents' inner mental state	*little*	*significant*
Type of knowledge acquired	*universal, nomothetic: theoria (theoria is a dissociation of universal knowledge from human interest)*	*particular, idiographic: praxis (praxis is a knowledge of how to act appropriately in a variety of particular situations)*

Table 4-3

adapted from: Burrell & Morgan, 1979; Jick, 1979; Evered & Louis, 1991; Layder, 1993; May, 1993; Guba & Lincoln, 1994; Lacity & Janson, 1994; Mason, 1994; Prein, Kuckartz, Roller, Ragin, & Kelle, 1995; Myers, 1997

CONTRASTING QUALITY CRITERIA

GOODNESS OR QUALITY CRITERIA	PARADIGM	
	Positivism	**Interpretivism**
Approach to validity	*Does an instrument measure what it is supposed to measure?* *(internal and external validity)*	*Has the researcher gained full access to the knowledge and meanings of informants?* *Credibility (internal validity)* *Transferability or applicability (external validity)* *triangulation/mixed methods*
Approach to reliability	*Will the measure yield the same results on different occasions (assuming no real change in what is to be measured)?* *(reliability)*	*Will similar observations be made by different researchers on different occasions?* *Dependability (reliability)*
Approach to generalisability	*What is the probability that patterns observed in a sample will also be present in the wider population from which the sample is drawn?* *(universality)*	*How likely is it that ideas and theories generated in one setting will also apply in other settings?* *Purposeful sampling or situational relevance (generalisation)*
Approach to objectivity	*(objectivity)*	*Confirmability (objectivity)*

Table 4-4

adapted from: Easterby-Smith, Thorpe, & Lowe, 1991; Ross, 1996; Guba & Lincoln, 1994; Lacity & Janson, 1994; Mentzer & Flint, 1997

Validity, an important by-product of triangulation, is shown in Table 4-4 above. Rigour is important in research based on all paradigms. However, the statistical methods customarily used in positivism lend themselves to providing quantitative measures of validity, reliability, and generalisability.

The more subjective paradigms often deal with qualitative data necessitating a different approach to and appreciation of issues of rigour. Much of this rigour comes from peer affirmation.

4.2.2 The chosen paradigm

Is one's chosen paradigm driven by assumptions about the subject, the questions of knowledge and reality, and the individual's research relationship to the social world under examination? Or is it driven by the questions and preferred methods? While the former is probably favoured by most philosophers, the latter can occasionally be acceptable. The researcher does not come up with questions and selected methods in a vacuum. They are derived from his professional experience and background, knowledge, and – in the case of methods – his experience and comfort level with their use. In turn, these assumptions owe their origins to and make up his personal paradigm. Blaikie suggested that one should consider a research strategy from both a pragmatic and a philosophical perspective (Blaikie, 1993). Pragmatic reasons influence the decision if one is trying to match a strategy to the nature of a particular research project as well as the questions involved. However, the 'world view' of the researcher – his personal preference for a particular philosophical position on the nature of social reality and how knowledge can be obtained – should take precedence.

A researcher goes into any project with some sort of philosophical 'baggage'. One's personal and innate paradigm is derived from one's background. In this writer's case, a previous career in the global freight business means the determinist/ subjectivist question is moot. It would be very hard to remain objective – immersion in the subject can lead to a type of subjectivist epistemology. In addition, a desire for understanding of a particular phenomenon rather than for prediction and causality could lead to a rejection of the determinist ontological stance. However, as will be

seen, certain paradigms accept a determinist ontology without the need for the traditional process of deriving causality through hypothetico-deductive means.

In the mid-eighties Whitley discussed the position of management research between academic and practical research (Whitley, 1984). He concluded that there were some important differences between practically oriented and intellectually oriented research involving goals and audiences. However, under a paradigm called *realism*, Whitley suggested there were no epistemological barriers to management research being 'scientific'. Under this paradigm, the researcher attempts to gain knowledge of invariant causal mechanisms which operate as tendencies in open systems. Whitley submitted that management research carried out under the realist banner may be essentially explanatory: '...research goals and orientation may be primarily intellectual and explanatory so that the main concern is to understand and explain managerial practices and activities as part of more general phenomena such as changing patterns of the organisation and control of work in highly differentiated societies. The basic focus here is to provide better explanations of theoretically significant phenomena...' (Whitley, 1984).

4.2.3 Realism

Management research within the realism paradigm attempts to understand the mechanisms and structures upon which social behaviour is based (Harré, 1986). Outhwaite said that one of realism's strong points was its emphasis on ontology rather than epistemology: 'No serious account of knowledge can begin without the assumption that "to be" is more than "to be perceived". And no theory of science is conceivable without the assumption that what we are pleased to call laws of nature operated in the same way as they do now before humans evolved and a fortiori before they began to do science' (Outhwaite, 1987). Adherents of realism

suggest that positivism entails an epistemic fallacy in that it attempts "to analyse being in terms of our knowledge of being" (Outhwaite, 1987). This is the belief that questions of ontology can be reduced to questions of epistemology. This leads to reality becoming simply the course of events occurring in experience. With reality so contained the "whenever this then that" conception (causality) becomes the only form of scientific generality or "law" that can be sustained (Pratten, 1997).

Realism, therefore, views both the natural and social world objectively. Referring to the ontology of realism, Bhaskar said that 'things exist and act independently of our descriptions, but we can only know them under particular descriptions' (Bhaskar, 1978). Under realism, science becomes a systematic attempt to express in language the structure and the way things act that exists independently of our conception of them. Burrell and Morgan contend that realism '...postulates that the social world external to individual cognition is a real world made up of hard, tangible and relatively immutable structures' (Burrell & Morgan, 1979). The job of science, whether natural or social, then becomes not one of recording regular co-occurring events but of determining the underlying structures that generate the social phenomena in question and that exist independently of science's knowledge of them.

Realism accepts that the social world is real and exists. However, it also accepts the interpretivist view that society is both produced and reproduced by its members who may have different perceptions and interpretations about the same reality. As Layder explains, 'a central feature of realism is its attempt to preserve a "scientific" attitude towards social analysis at the same time as recognising the importance of actors' meanings and in some way incorporating them in research' (Layder, 1993). Blaikie also noted that '...while sharing positivism's desire for producing causal explanations and interpretivism's views on the nature of

social reality, realism argues for a view of science that is different from either of these approaches' (Blaikie, 1993).

Realism differs from positivism through its emphasis on ontology and through its view of reality. Realism argues that the 'world out there' exists but, unlike with positivism, it may not be possible to perceive its basic nature. Therefore, the aim of realism becomes a search for generative mechanisms rather than predictive theories. It differs from interpretivism because it takes an objective non-voluntaristic view of society. Realists (practitioners of realism as opposed to a *realist* ontology) believe humans do not necessarily create society. Bhaskar suggests generative mechanisms exist prior to our knowledge of them (Bhaskar, 1989). He further states, 'Realists argue for an understanding of the relationship between social structures and human agency that is based on a transformational conception of social activity, and which avoids both voluntarism and reification.... We do not create society – the error of voluntarism. But these structures which pre-exist us are only reproduced or transformed in our everyday activities; thus society does not exist independently of human agency – the error of reification. The social world is reproduced or transformed in daily life' (Bhaskar, 1989). May states the main assumptions of realism: 'Realism argues that the knowledge people have of their social world affects their behaviour and, unlike the propositions of positivism and empiricism, the social world does not simply exist independently of this knowledge. However, people's knowledge may be partial or incomplete. The task of social research is not simply to collect observations on the social world, but to explain these within theoretical frameworks which examine the underlying mechanisms which structure people's actions and prevent their choices from reaching fruition' (May, 1993).

With realism, reality is stratified into the domains of the real, the actual, and the empirical. The real domain is made up of entities and

mechanisms; the actual domain is made up of events derived from the interactions of these entities and mechanisms; and the empirical domain is made up of our experiences of the above events (Bhaskar, 1978). The move from the real to the actual and the actual to the empirical is contingent: for example, the empirical domain is in a contingent relationship to the other two – again, to be is not necessarily to be perceived! (Outhwaite, 1987). Based on the work of Bhaskar, Outhwaite summarises the ontological assumptions of realism:

1. There is a distinction between the transitive and intransitive objects of science as well as between our concepts and models and the real entities and relations which make up the natural and social world;
2. The world is constituted not only by events and states of affairs (the actual domain), and our experiences or perceptions of those actualities (the empirical domain), but also by structures, powers, and their tendencies (the real domain) that, although perhaps not directly observable, nevertheless exist, whether or not detected, and govern the actual events that we do or may experience. In short, three overlapping, but ontologically distinct, domains of reality are distinguished (see Figure 10). These three domains are also unsynchronised or out of phase. Thus, while experiences are out of phase with events allowing the possibility of contrasting, as well as revisions to, experiences of a given event, so events are typically unsynchronised or out of phase with the mechanisms that govern them.
3. Causal relations are conceived as tendencies, grounded in the interactions of generative mechanisms; these interactions may or may not produce events which in turn may or may not be observed (Outhwaire, 1987).

THE ONTOLOGICAL DOMAINS OF REALISM

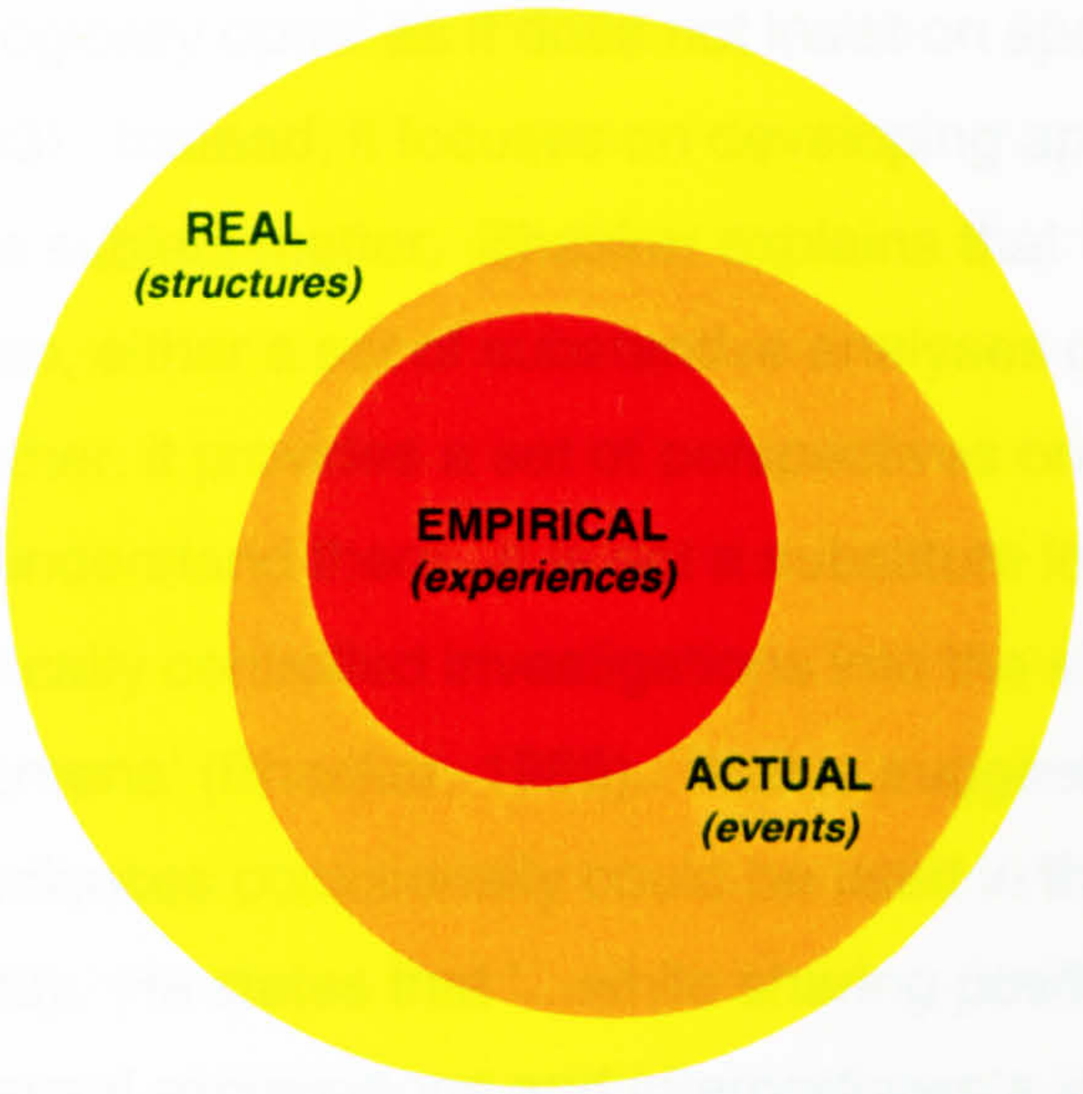


Figure 4-2

(based on Bhaskar, 1978)

Along with this non-atomistic ontology there is a non-empiricist epistemology. Realism emphasises that the interpretations of science – natural or social – are basically hypotheses as they can be amended or rejected by further discoveries. Bhaskar describes these hypotheses as 'the transitive objects of science, created by human beings to represent the intransitive objects of science, the entities and structures of reality' (Bhaskar, 1978). This rejection of empiricism is expressed in the concept of real definitions. Real definitions are statements about the basic nature of some entity or structure. Thus, the realist conception of explanation becomes the postulation of explanatory mechanisms and the attempt to demonstrate their existence. Realism's epistemology is based on building models of these explanatory mechanisms such that, were they to exist and act in the postulated way, they would account for the phenomenon under examination.

At the practical level, Layder has suggested that realism attempts to reconcile the often conflicting concepts of positivism and interpretivism by preserving a scientific attitude towards social analysis while concurrently

recognising the importance of actors' meanings (Layder, 1993). Realism is 'methodologically open' as it does not insist on specific methods (Blaikie, 1993). Instead, it focuses on developing appropriate methods based on the subject matter. Bhaskar explains that '...realism is not, nor does it license, either a set of substantive analyses or a set of practical policies. Rather, it provides a set of perspectives on society (and nature) and how to understand them. It is not a substitute for, but rather helps to guide, empirically controlled investigations into the structures generating social phenomena' (Bhaskar, 1989). Blaikie suggests that the methods of the natural sciences occasionally could be used in the social sciences (Blaikie, 1993). He states that '...while sharing positivism's desire for producing causal explanations and interpretivism's views on the nature of social reality, realism argues for a view of science that is different from either of these approaches'. May elaborates: 'Realism argues that the knowledge people have of their social world affects their behaviour and, unlike the propositions of positivism and empiricism, the social world does not simply exist independently of this knowledge. However, people's knowledge may be partial or incomplete. The task of social research is not simply to collect observations on the social world, but to explain these within theoretical frameworks which examine the underlying mechanisms which structure people's actions and prevent their choices from reaching fruition' (May, 1993). Layder and Mingers suggest that both qualitative and quantitative data can be used in realist research (Layder, 1993; Mingers, 1997a & 1997b). As it is almost impossible to construct a closed environment (closed system) for research in the social sciences, Tsoukas suggests that theories are explanatory, not predictive because 'explanation and prediction are symmetrical only under conditions of closure' (Tsoukas, 1989).

In its simplest form Blaikie suggests the realist conception of science involves three steps:

1. a phenomenon, or range of phenomena, is identified,

2. explanations based on the postulated existence of a generative mechanisms are constructed and empirically tested, and
3. this mechanism then becomes the phenomenon to be explained, and these steps are repeated (Blaikie, 1993).

Therefore, the practice of science under realism is the process of description, explanation, and redescription, in which the layers of reality are continually peeled back like an onion. After each set of structures and mechanisms is postulated, tested, and 'revealed', others go through the same process. Differences between the actual and real domains keep changing as the layers are removed (Bhaskar, 1979). Bhaskar adds, 'In this continuing process, as deeper levels or strata of reality are successively unfolded, science must construct and test its explanations with the cognitive resources and physical tools at its disposal, which in this process are themselves progressively transformed, modified and refined' (Bhaskar, 1979). To reword the quote about life attributed to Carl Sandberg: '(Research) is like an onion. You peel back the layers one by one – and sometimes you cry!'

Research under the realist banner focuses on discovering the mechanism(s) that generate events. Harré, therefore, suggested the main problem of realism became one of demonstrating the probable existence of these hypothesised mechanisms especially as they are not readily open to experience (Harré, 1979). Research becomes the building of a convincing explanation of this mechanism which is behind the phenomenon under investigation.

4.3 The resultant research strategy

Between the positivist assumption that there is a 'world out there' independent of our perception and the interpretivist view that reality is but a mental construction lies the realist view that the 'world out there' does exist but it may not be possible to perceive its basic nature. The aim of

realist research becomes a search for generative mechanisms rather than predictive theories. Porter suggests realism is appropriate to research in the social sciences, especially in management research: '...the aim (of realism) is not to describe events, but to explain why they occur' (Porter, 1993).

Blaikie describes four research strategies that incorporate both a logic of theory construction and a research process (Blaikie, 1993). Induction, which is associated with positivism, starts with a singular or particular statement and concludes the argument with a general or universal statement. Deduction, which is associated with critical rationalism, begins with a general or universal statement and ends with a singular or particular statement. Abduction, which is associated with interpretivism and hermeneutics, constructs theory by moving from descriptions of social life based on the actors' own meanings, to technical descriptions of that life. Abductive research derives categories and concepts directly from these lay descriptions. Retroduction, the strategy associated with realism and the one followed in this research, is a process of hypothesis formulation in which the construction of hypothetical models uncovers the mechanisms and structures which lie underneath empirical phenomena (Blaikie, 1993).

This iterative process of retroduction involves describing, explaining, and re-describing the resulting layers of reality as they are 'peeled back'. Applying this to the writer's research results in the following steps:

Descriptive step – The phenomena of service intermediation in global logistics and the inter-relationships amongst shipper, carrier, and freight forwarder are identified.

Explanatory step – It is then postulated that the global freight intermediary offers lower costs *in total* to the global shipper. As will be seen in a subsequent chapter, this postulated explanation is derived through interviews with shippers,

intermediaries, and carriers, both air and ocean, as well as from the literature.

Re-descriptive step – The phenomenon of the presence of the airfreight forwarder in the purchase of global airfreight is identified and targeted.

Consequent explanatory step – It is then postulated that the existence of transaction costs, especially those related to the cost of searching and maintaining a buyer/seller relationship, is the generative mechanism explaining the presence of this global airfreight intermediary. This presumed transaction cost mechanism leads buyers of global airfreight to choose between a market approach (using the intermediary) or a hierarchical approach (internalising the intermediary function and dealing directly with the ultimate supplier). If this transaction cost model correctly represents these structures and mechanisms then the phenomenon of intermediary position in the supply chain would be causally explained.

Consequent re-descriptive step – The generative mechanism of transaction costs then becomes the phenomenon to be explained. This 'explanation' of transaction costs as a generative mechanism for the existence of the intermediary in global airfreight becomes an extension of present Transaction Cost Theory: an addition in the number of nodes in a supply chain may reduce costs down the chain rather than raise them because intermediaries may offer the buyer both decreased transaction costs (mainly through reduced search and relationship maintenance costs) and decreased production costs (through scale economies).

Blaikie summarised the retroductive strategy in seven stages based on the work of Harré and Keat and Urry:

1. *Discovery* – In order to explain observable phenomena and the regularities that exist between them, scientists must attempt to discover appropriate structures and mechanisms.
2. *Model construction* – Since these structures and mechanisms will typically be unavailable to observation, a model is first constructed which often draws upon already familiar sources.
3. *Explanation* – The model is such that, were it to represent correctly these structures and mechanisms, the phenomena would then be causally explained.
4. *Testing* – The model is then tested as a hypothetical description of actually existing entities and their relations.
5. *Confirmation* – If these tests are successful, this gives good reason to believe in the existence of these structures and mechanisms.
6. *Verification* – It may be possible to obtain more direct confirmation of these existential claims by the development and use of suitable instruments.
7. *Repetition and extension* – The whole process of model-building may then be repeated, in order to explain the structures and mechanisms already discovered. (Harré, 1961; Keat & Urry, 1975; Blaikie, 1993)

This research strategy was followed in the research. The initial stage of discovery involved asking what are the structures and mechanisms that co-exist with the phenomenon of service intermediation in global logistics and, therefore, what gives rise to freight forwarders? Subsequent stages will be disclosed in this thesis in conjunction with the actions that took place and the ensuing results.

Model construction is obviously important when taking a realist approach. Based on Achinstein's definition of models Blaikie suggests that research under a retroductive strategy would likely use theoretical or imaginary types of models (Achinstein, 1968; Blaikie, 1993). A theoretical model is

defined by Achinstein as one that applies a familiar theory in new ways by drawing from it assumptions about another object or system. As approximations, these models are not theories because they omit complicating factors and deal in absolute relationships. In this research the theoretical model is based on transaction cost theory as applied to a service intermediary. The intermediary's relationships, both up and down the supply chain, are paramount. Transaction cost theory is extended into the triadic relationship of buyer, intermediary, and seller.

4.4 The derived research design: Appropriate research methods

Hamilton and Ives suggest that picking the right research strategy is secondary to choosing the right questions and picking the best method or methods for answering those questions (Hamilton & Ives, 1992). These questions and methods should be based on the objectives of the study, the setting in which the research takes place, and other relevant factors. However, other writers have declared that the paradigm taken by the researcher should be the key factor in determining the methodological approach to be adopted (Easterby-Smith, Thorpe, & Lowe, 1991). Blaikie has stated that there is no unequivocal link between any philosophical stance and a particular set of methods (Blaikie, 1993). The important point he makes is how these methods are used: the paradigmatic position taken by the researcher establishes that.

Exploratory questions are likely more open to qualitative methods because such methods are more concerned with emergent themes, a key component of exploratory research. In this research the research problem was to explain and perhaps justify the freight forwarder's position in the global supply chain. Because of the scarcity of research done in this area, the need to understand the relationships between the participants and their understanding of each other suggested a multiple method approach. Such an approach could entail both qualitative and quantitative methods.

The figure on the following page presents the sequential stages that make up the research design. The research began with a review of the literature on supply chain relationships, logistics, and intermediaries as well as appropriate means to discovering the answers to questions posed. This review, in addition to the writer's approach to research, led to both a research focus and a suitable strategy. The research focus became the relational triad comprising the freight forwarder, the shipper (and, by implication, the importer), and the carrier. As discussed previously the research strategy became the retroductive strategy of model building and testing associated with the realist perspective. The proposition on which the initial research model was based was derived from this focus on the relationships amongst the three supply chain members. The literature seemed to indicate that costs (both measurable and perceived) and relational aspects were of fundamental importance in the position and status of the global freight intermediary in the global supply chain.

The initial research model below was a simple triadic network sub-group made up of the three parties as in Figure 4-3A below:

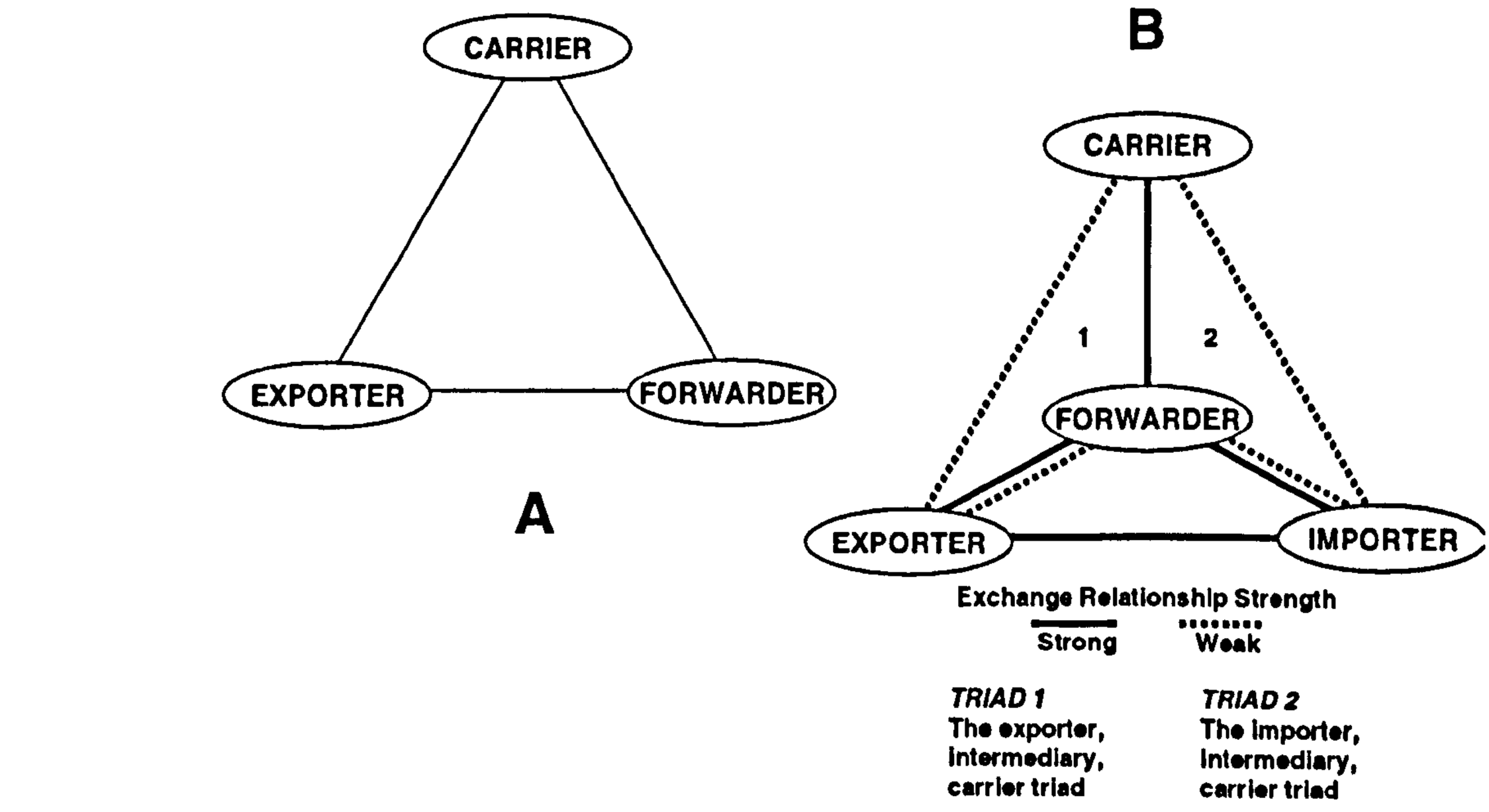


Figure 4-3

Figure 4-4 THE STAGES OF THE RESEARCH

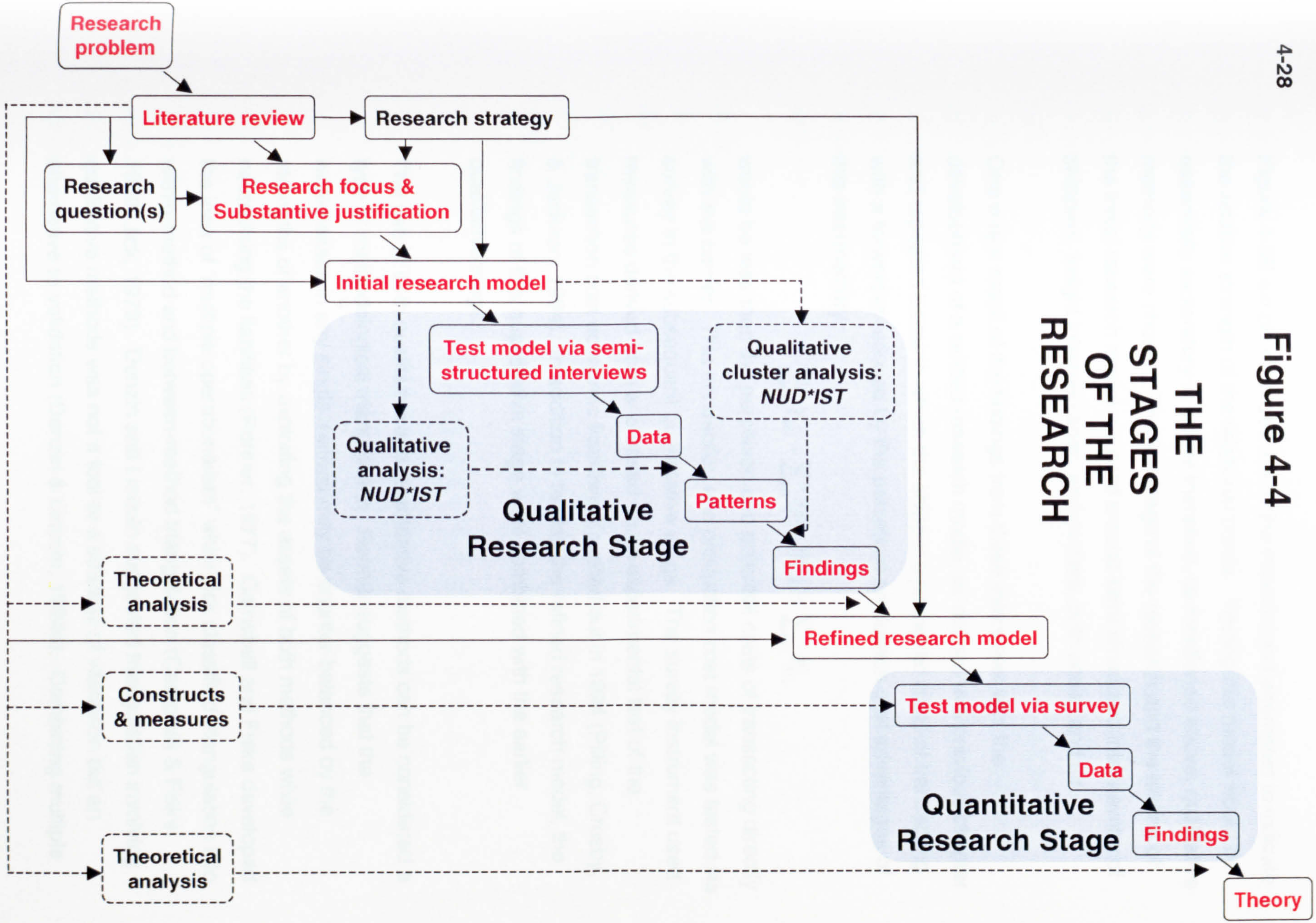


Figure 4-3B simply extended this to the importer and attempted to indicate the relative strength of the relational bonds. Testing this model would be essentially exploratory in nature therefore, as mentioned above, qualitative methods were chosen. The first stage of the research and the testing of the initial research model revolved around semi-structured interviewing of shippers, freight intermediaries, and carriers, both ocean and air.

One major result of the findings from these interviews was the development of a refined research model, as defined in a previous chapter and repeated below in which the shipper's perceived costs of transacting with a forwarder reduced by the perceived production cost advantages of this intermediary.

$$\sum_{i=1}^{k} T_{SF_i} - \sum_{i=1}^{m} (P_F - P_C)_i \leq \sum_{i=1}^{n} T'_{SC_i}$$

would be less than the perceived and potential costs of transacting directly with the carrier. This transaction and production cost model was tested via survey in the subsequent quantitative stage. The survey instrument used measures derived from and based on an experimental test of the transaction cost economic framework carried out in 1994 (Pilling, Crosby, & Jackson, 1994). In addition to testing the refined research model, the findings of this quantitative stage were combined with the earlier qualitative stage.

The use of both qualitative and quantitative methods can be considered a type of methodological triangulation. Rohner suggests that the weaknesses in any single method may be counter-balanced by the strengths of another by exploiting the assets of both methods while neutralising the liabilities (Rohner, 1977). Campbell and Fiske developed the idea of "multiple operationalism" while Jick classified triangulation into within-method and between-method triangulation (Campbell & Fiske, 1959; Jick, 1979). Denzin and Lincoln suggested triangulation involving qualitative methods was not a tool or a strategy of validation but an alternative to validation (Denzin & Lincoln, 1994a). Combining multiple

methods, empirical materials, perspectives or observers would bring rigour, breadth, and depth to an investigation. In the 1990s triangulation, especially that involving a combination of quantitative and qualitative methods, seems to have become "de rigueur" (Patton, 1990; Mason, 1994; Morse, 1994; Roffey, 1995; Ross, 1996). In general, these writers have classified triangulation as that involving data triangulation (between individuals or groups; between regions, firms, or industries; or across time), method triangulation (between method or across time), investigator triangulation (research teams analysing data), and theoretical triangulation (interpreting data from different theoretical perspectives). In addition to the method triangulation employed in this research, there is a variation of data triangulation as the qualitative data obtained in the first stage was compared to the findings of the second, quantitative stage.

Miles and Huberman suggested four ways of linking qualitative and quantitative methods (Miles & Huberman, 1994). One proposal was to begin with (qualitative) exploratory fieldwork which would lead to the development of some sort of quantitative instrument such as a questionnaire. The findings obtained from the survey could be further refined and tested in a subsequent qualitative stage.

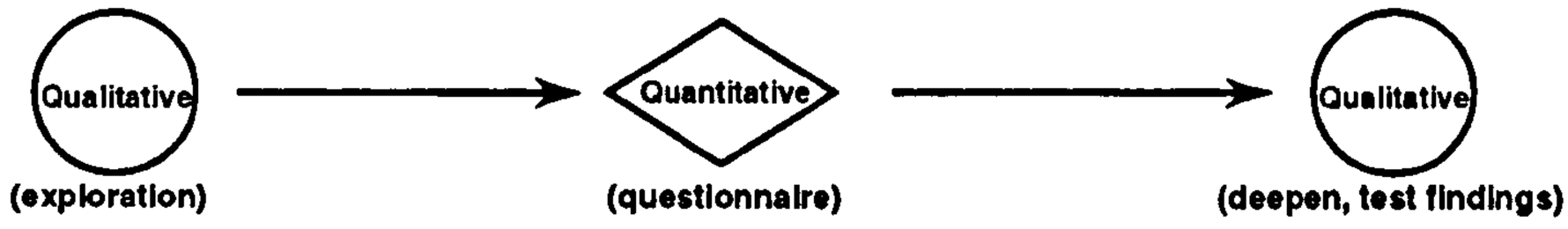


Figure 4-5

(*Miles & Huberman, 1994*)

4.5 Other methods considered

While the research questions and the researcher's own paradigm led to an exploratory and testing approach using qualitative and quantitative methods the exact choice of qualitative and quantitative method was carefully thought out. There were, of course, alternatives to the semi-

structured interviewing method which would allow qualitative testing of the initial model. In addition, several options were open for the quantitative testing of the TCT approach to cost reduction as value enhancement.

4.5.1 Qualitative methods considered

Two additional and differing qualitative methods were considered. As an exploration into a relatively little researched area, albeit one in which the writer was experienced, an approach based on grounded theory seemed appropriate. Grounded theory is an abductive strategy in which the meanings and theories are *grounded* in the language of the participants. From these laymen's descriptions and activities arise the categories and concepts that form the basis of an understanding or an explanation of the problem (Blaikie, 1993). The original proponents of grounded theory – Glaser and Strauss – suggested that their methodological approach was inductive and iterative. Inductive because researchers would look for patterns and relationships in the data as compared to the logico-deductive approach common in the late 1960s. Iterative because data collection and theory building would alternate (Glaser & Strauss, 1967; Strauss & Corbin, 1990; Strauss & Corbin, 1994).

However Glaser and Strauss split in their later conception of their theory. Glaser followed a pure form while Strauss, in conjunction with Corbin, suggested ways to make GT (grounded theory) more acceptable to (management) researchers (Glaser, 1992; Roffey, 1995). The key disagreement was their differing approaches to the idea of the problem or concepts *emerging* or being *forced* from the data. With pure GT one would allow these concepts to emerge or arise from the data by not going into research with any pre-conceived ideas. Interview-type data would be acquired through unstructured interviewing without any framework to disturb the language (Glaser, 1992). In contrast, Strauss and Corbin suggested strategies, procedures, and techniques to help the researcher

'reach' theory more quickly. Glaser's GT generated concepts and their relationships to explain variation in the substantive area. This would result in a set of conceptual hypotheses which would be left to other researchers to test. However, Strauss and Corbin's vision of GT would produce an inductively derived theory with interrelated concepts and would attempt limited testing for validity and conceptual relationships (Roffey, 1995).

The use of Grounded Theory entails not only a different set of methodological tools than used in this research but also a different research strategy (abductive versus retroductive). Because of the writer's background, It would be difficult to enter into research in the substantive area of global logistics without any preconceived ideas, problems to solve, or a framework on which to hang the conceptual work. Certainly, the basic method used within GT – that of generating data through interview, then coding it, and analysing it through categorisation and comparison – is common to other paradigmatic positions that use qualitative research.

However, within the logistics field, grounded theory, especially as advanced by Glaser, may not be acceptable. Some logistics writers have suggested qualitative methods are best used as either an adjunct to or as an inductive first step prior to quantitative testing (Seaker, Waller, & Dunn, 1993; Mentzer & Flint, 1997). There are signs this might be changing: in 1996 Ellram encouraged the use of qualitative methods in case-study research (Ellram, 1996).

A second considered approach to the initial exploratory model was to use a qualitative Delphi Panel. Delphi panels originated in 1964 with the well-known RAND report on long-range forecasting (Gordon & Helmer, 1964). Because they solicit the opinion and consensus of a group of individuals – expert or otherwise – they are often considered a sub-group of focus groups. However, Delphi panels normally use quantitative methods based on surveys. There are three common features that make up most Delphi

panels: anonymous response thus providing security and negating group dynamics; iteration and controlled feedback from the previous round of questioning; and statistical group response in order to derive shared opinion, often through consensus (Dalkey, 1969). After each round of questioning the respondents are provided with feedback of the group's response and their own position. The respondent can either shift subsequent answers towards the group median, shift further away ('swingers'), or resist changing their answers ('holdouts') (Parenté & Anderson-Parenté, 1987; Scheibe, Skutsch, & Schofer, 1975). The number of rounds is usually limited to three or four.

Delphi panels have been used in logistics research. In 1988 Robeson asked business managers to predict trends in logistics in the mid 1990s (Robeson, 1988). Five years later Cooper surveyed European logistics managers to predict very much the same trends in the early 21st Century (Cooper, 1993; Cooper, 1994). Repeating this type of research, Lynch et al looked at these future trends from a Canadian perspective (Lynch, Imada, & Bookbinder, 1992).

However, research that used a Delphi panel for qualitative research proves more elusive. In 1988 Parenté and Anderson-Parenté suggested qualitative discussion and forecasting would prove useful in conjunction with quantitative measures (Parenté & Anderson-Parenté, 1988). Robeson's work in 1988 had some qualitative elements (Robeson, 1988). Jenkins and Thoele called the forecasting methods of Delphi panels qualitative though they stressed quantitative methodology (Jenkins & Thoele, 1991). In Denzin and Lincoln's Handbook of Qualitative Research Fontana and Frey proposed Delphi panels as a form of structured group interviewing technique in order to pre-test or explore a concept or area (Fontana & Frey, 1994). A scenario approach can often be related to Delphi panels. Everton's examination of the future of sea ports in South Africa and the U.K. used scenarios to elicit predictions and was based on

quantitative and qualitative analysis (Everton, 1996). Powell-Kennedy carried out Delphi research into midwifery using qualitative data (Powell-Kennedy, 1998). Though she used NUD*IST to analyse the resultant text it was done so using content analysis. This method measures the number of times a word, phrase, or synonym thereof appears and is considered more quantitative than qualitative.

Scheele presented some interesting concepts involving Delphi panels (Scheele, 1975). He suggested making up panels comprised of two or three distinctive subgroups in order to introduce ambiguity and note differences. Freight forwarders, shippers, and carriers would fit nicely into such sub-groups. He also suggested feedback via graphical representation plus anonymous comments – bits of relevant text – from the respondents. This graphical representation was described as '...a shorthand of positional relationships' which is very much how the triadic relationships amongst the three sub-groups was summarised.

Consensus is not the raison d'être for iteration within Delphi panels. Pill suggested that more emphasis should be paid to Delphi panels as communication devices rather than as scaling devices (Pill, 1971). Linstone and Turoff as well as Rowe et al agreed, characterising Delphi panel research as a method for structuring group communication (Linstone & Turoff, 1975; Rowe, Wright, & Bolger, 1991). The reasons to use a Delphi panel for the research in this dissertation would be five-fold: to develop concepts and explore the area; to provide feedback and some modicum of discussion; for reason of expediency – it would be difficult to get even a small number of high level executives in the same room at one time; the independence of the respondents; and the relational vulnerability or competition that could exist amongst them.

However, perhaps as with grounded theory, qualitative Delphi panels may be considered too radical and difficult to manage for logistics research.

Certain aspects of Delphi panel research were used in this research. Feedback was provided to the interview respondents in the exploratory research phase (Appendix E). This feedback took the form of graphical representations, categorised segments of text, and matrices. Such feedback was sought by the respondents and ensured their future assistance for testing of concepts and survey instruments. In addition, with qualitative research of any sort, feedback is considered a form of validation (Miles, 1979; Roffey, 1995).

Therefore, several other qualitative tools were considered to explore the initial model of the triadic relationships amongst forwarders, carriers, and shippers. In the end, a series of semi-structured interviews with members of these three sub-groups provided the data needed. Some aspects of grounded theory and Delphi panels were used: coding, analysis, and categorisation as well as feedback. But the difficulties with these methods proved insurmountable in answering the questions posed.

4.5.2 Quantitative methods considered

Prior to deciding on TCA as a means of testing the concept of intermediary cost reduction as value enhancement several other methods were considered. Initially influencing the decision, and as may be expected from the emphasis placed on it in Chapter 2, was Social Network Analysis (SNA). The relationship between SNA and supply chains and networks is well documented (Cunningham & Tynan, 1993; Pardo & Salle, 1994; Rao & Young, 1994; Harland, 1996). However, while conceptual papers linking supply chain management with social network analysis exist, either as a major or minor issue, little empirical work has been done. Certainly, as mentioned earlier, the concept of graphically portraying the supply chain or network as a series of links and nodes owes much to SNA (i.e., sociograms: Moreno, 1934). The operationalised concepts of relationships within SNA – closeness and distance, centrality, power,

intensity, durability versus transience, and the separation of relational (structural) and attribute (compositional) data have their place in supply chain research. Other concepts such as clustering or grouping, density, fragmentation, reachability, centralisation, are more appropriate to research involving the individual actor (Barnes, 1974; Tichy, Tushman, & Fombrun, 1979; Marsden, 1990; Scott, 1991; Freeman, 1992).

SNA focuses on the relationships amongst social entities including economic transactions between firms (Wasserman & Faust, 1994). However, it does so based on a restricted set of data. The goal of SNA is to obtain from this low-level data, descriptions of the structure of a system. From this, patterns may emerge or hypotheses may be tested based on the interrelationships in the network (Rice & Richards, 1985). Understanding the relational structure of the triadic global logistics system was the goal of the *first* exploratory phase of this research. The goal of this subsequent second phase was to test the concept of intermediary cost reduction as value enhancement. The structure was assumed; understanding was sought.

While SNA was rejected as a means to test the primary concept arising from the first phase, certain aspects of it were kept. The separation of the firm (as node) and the exchange relationship (as link), the use of the triad to graphically enhance the position of the intermediary, and certain demographic measures operationalised in the final survey were all derived from SNA.

This separation of relational and attribute data is also significant to another quantitative method considered. Cluster analysis is a set of techniques which is used to classify individuals or objects into a number of groups. Homogeneity is desired within each group whereas heterogeneity is sought between groups (Towriss, 1979; Everitt, 1980; Aldenderfer & Blashfield, 1984). Cluster analysis (CA) has also been considered as a

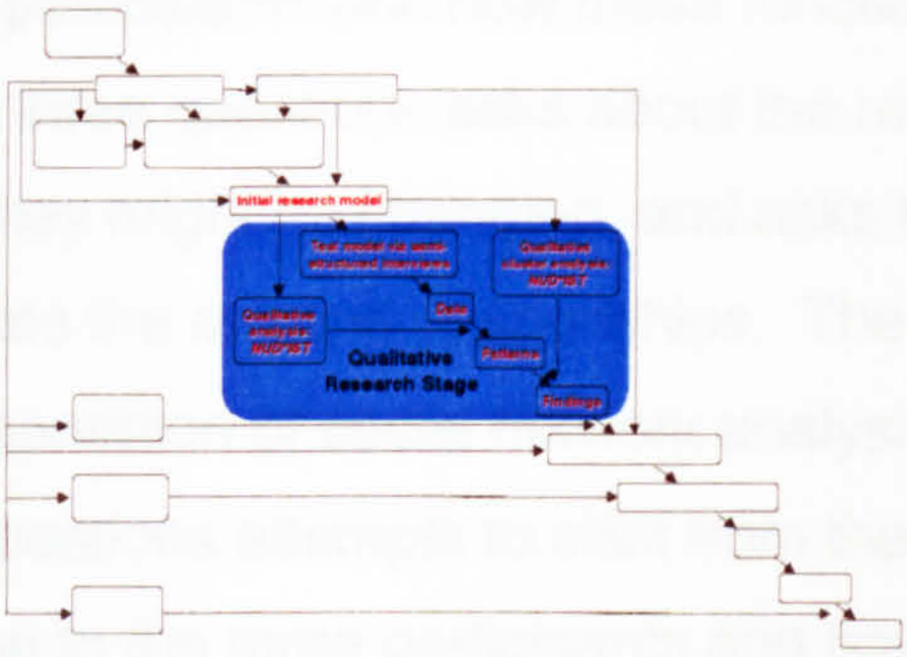
technique within social network analysis (Rice & Richards, 1985; Gerlach & Lincoln, 1992). Because CA looks for correlation between variables it may have been possible to look for grouping with relational variables of the triadic sub-groups. It may be that those shippers who use airlines have a different, but intra-related, set of relational measures than those shippers who prefer to use freight forwarders. However, there is no a priori specification involved in CA. If one seeks to classify firms or individuals into *predetermined* groups discriminant analysis might be the better choice (Towriss, 1979).

4.6 Summary

The previous chapters looked at *what* the study was about: the substantive areas, academic application, and appropriate methods. This chapter has examined *how* one might carry out a research strategy and design that can best answer the questions that have arisen. Subsequent chapters will look at both the qualitative and quantitative models and stages, the actual methods employed, the data obtained, the analyses, and the subsequent interpretation of the findings.

Chapter 5: QUALITATIVE RESEARCH STAGE: THE INITIAL RESEARCH MODEL

5.1 Introduction



The initial research model focuses on the exchange relationships between shippers, carriers, and global logistics intermediaries. Because this fundamental model suggests exploratory research, a qualitative methodological approach was deemed most appropriate. The intent of such an approach was to explore the perceived value of the intermediary from the point of view of both the shipper and the carrier, the dynamics of the triad, and transport modal differences. As this area is somewhat bereft of empirical research an approach entailing semi-structured interviewing was taken. This would hopefully elicit the data needed as well as allowing flexibility in questioning. This proved fortuitous as many of the respondents provided extremely useful data that may not have been obtained with a structured or written approach.

The interview schedule (see Appendix A) consisted of a series of semi-structured questions with their associated probing questions. Its purpose was to bring out the shared functions, roles, and relationships between the shipper, intermediary, and carrier. The reference to shared functions would be another way to approach the commercial interaction amongst these participants. In social network analysis, role plays a part, both as a component of networks and as a model of a set of relations (Barnes, 1974). In addition, role definition on the part of respondents presents a viable way

for qualitative researchers to obtain metaphorical examples (Tsoukas, 1991).

The first two main questions ask about the functions shared amongst the three participants and how these functions might be changing. The second set of three questions asks about the relationships amongst the participants, how they might be changing, and asks the respondent to graphically illustrate the existing relationships. The latter originates from the graphical representation of social network analysis (Freeman, 1992). The next set of two questions attempts to elicit from the respondents the roles they might ascribe to the three participants and how they might be changing. The use of metaphors by the respondents was sought (Question 6) in order to encourage another way or ways of describing the phenomenon (Tsoukas, 1991). Beer suggests matching the phenomenon or topic to a suitable metaphorical vehicle, moving analogously through a conceptual model, and concluding with a generalised scientific model (Beer, 1984). The eighth question asks if shippers often deal directly with carriers and, therefore, bypass the intermediary. A key probing question was *why* a shipper may or may not deal directly with a carrier. Finally, the last question attempts to draw out the relative importance of information in the relationship. This interview schedule was tested and refined with three intermediary participants in Britain and Canada.

The final participants comprised top executives from shippers, global carriers, and intermediaries who would be involved with and cognisant of the areas mentioned above. Positive response from potential intermediary and air carrier respondents was immediate and universal while that from ocean carriers was exceedingly difficult to obtain. In the former cases snowball sampling techniques were used while with the ocean carriers and shippers it became a matter of cold-calling and referral (Goodman, 1961; Frank, 1979; Tichy, Tushman, & Fombrun, 1979; Jenkins & Thoele, 1991;

Markoczy, 1996). The resultant twenty two respondents represented the three subgroups as follows:

1. *Shippers* were represented by:
   a) large and small shippers,
   b) those that outsourced the global logistics function and those that kept it in-house, and
   c) those that were private versus those that were government based.

   There were seven shipper-participants.
2. *Intermediaries* were represented by:
   a) traditional freight forwarders for whom personal relationships were paramount as well as those which stressed high tech solutions,
   b) those working predominantly in one transport mode and those providing multimodal services, and
   c) global, national, and single-location based companies.

   There were seven intermediary-participants.
3. *Carriers* were split between:
   a) air (with these three carriers representing European, Asian, and North American airlines) and
   b) ocean (with the exception of one of the three ocean carriers who separated their customers into shippers and freight forwarders resulting in two participant/interviews).

   In addition, there was one global carrier with origins in road haulage with ocean and air associations. Because of the additional ocean carrier respondent there were eight carrier-participants.

A sample of one of the interviews can be found in Appendix B

5.2 Tools for the analysis of qualitative data

Analysis of qualitative data normally goes hand-in-hand with acquisition therefore it is appropriate to describe the method of analysis being used within this qualitative stage. The use of computers in qualitative data analysis, while relatively new to mainstream research, has generated much interest. In this research, analysis of the semi-structured interview data obtained is handled using NUD*IST (**N**on-numeric, **U**nstructured **D**ata: Indexing, **S**earching, and **T**heorising) software, Version 4 (Richards & Richards, 1994a, 1994b; Miles & Huberman, 1994; Weitzman & Miles, 1995; plus the collection of articles in the book *Computer-Aided Qualitative Data Analysis* edited by Kelle, Prein, & Bird, 1995). Computer programmes for analysing qualitative data can best be categorised in one of the following five categories, considered as increasing in sophistication by Weitzman and Miles (1995):

Text Retrievers - finds words or phrases, singly or in combination. These often include the ability to search for sound-alike words, synonyms etc. They are useful for counting or creating lists of words or phrases as, for example, in content analysis.

Textbase Managers - Not only do these offer search and retrieve capabilities, they also create subsets of searches for subsequent searching operations.

Code-and-Retrieve Programmes - These programmes divide the text into sections (of a size either predetermined or variable), attach a code or codes to each section, and allow subsequent retrieval of sections by code. Prior to computers, this procedure of "cutting and sorting" would have been carried out by photocopying, with scissors, or with note cards.

Code-based Theory Builders - These continue on from code-and retrieve programmes by allowing connections to be made between codes and to categorise codes and connections at a higher level of abstraction. The resultant conceptual structure can often allow testing.

Conceptual Network Builders - This also allows one to build and test theory but via graphic networks not only hierarchical structures. Unlike code-based theory builders these use nodes representing ideas or variables and lines representing relations.

Previous versions of NUD*IST were regarded as code-based theory building programmes by Weitzman and Miles. However, the version (V 4) used for this research has the capability to link up with conceptual network building programmes in order to present the emerging theory graphically. Coding is important in most computer assisted qualitative data analysis software programmes as, indeed, it is in most qualitative research. The use of coding (or *indexing* as NUD*IST's creators refer to the process of replacing a section of text with a code or other symbol) allows retrieval of the text according to the code as well as cross-referencing by two or more codes. The coded text – or more correctly – the coding references to the text, can be 'stored' in arrangements that allow visual presentation of the data analysis. This is the fundamental difference between those programmes that simply offer code and retrieval tools in which the computer replaces scissors and paste and those programmes in which the codes become building blocks towards theory.

NUD*IST is a software programme that is a methodological 'toolkit' in that it is flexible enough to cover most qualitative methods (QSR NUD*IST 4 User Guide, 1997). The programme does this by splitting the retrieval and browsing features of word-processor type programmes into two: the researcher can search, code, and retrieve text units and, in addition, can also search and retrieve the resultant index/ coding categories. NUD*IST can be used as a simple, glorified word processor for textual search or to examine sophisticated index category relationships.

The coding or indexing function can be carried out independently of the process of relating the index categories. NUD*IST provides a hierarchical

structure or 'tree' for the purposes of storing or relating these categories. For example, this flexibility allows grounded theory researchers who are building theory up from the data and may not wish to create relationships between their index categories to simply store the coding 'folders'. Conversely, those researchers who have an a priori coding structure can have the data automatically fit itself to this structure.

The flow chart on the following page (Figure 5-1) indicates the **I**ndexing, **S**earching, and **T**heorising functions of NUD*IST as well as the dual databases for coding and transcript data.

With this research the coding for the base data was created in advance (Appendix C). By separating the respondent name and group one is able to ask questions of the data such as *'What did intermediaries say about X?'* or *'How do carriers' replies about Y differ from shippers' replies?'*. It also reduces the search time required, an important consideration when dealing with approximately 25,000 lines of text. A command file was written so that when each transcribed document was entered into NUD*IST the individual questions and answers – both main and probing – would be placed in a similar node. This would then allow the writer to open that question node and see all the respondents' answers to that question.

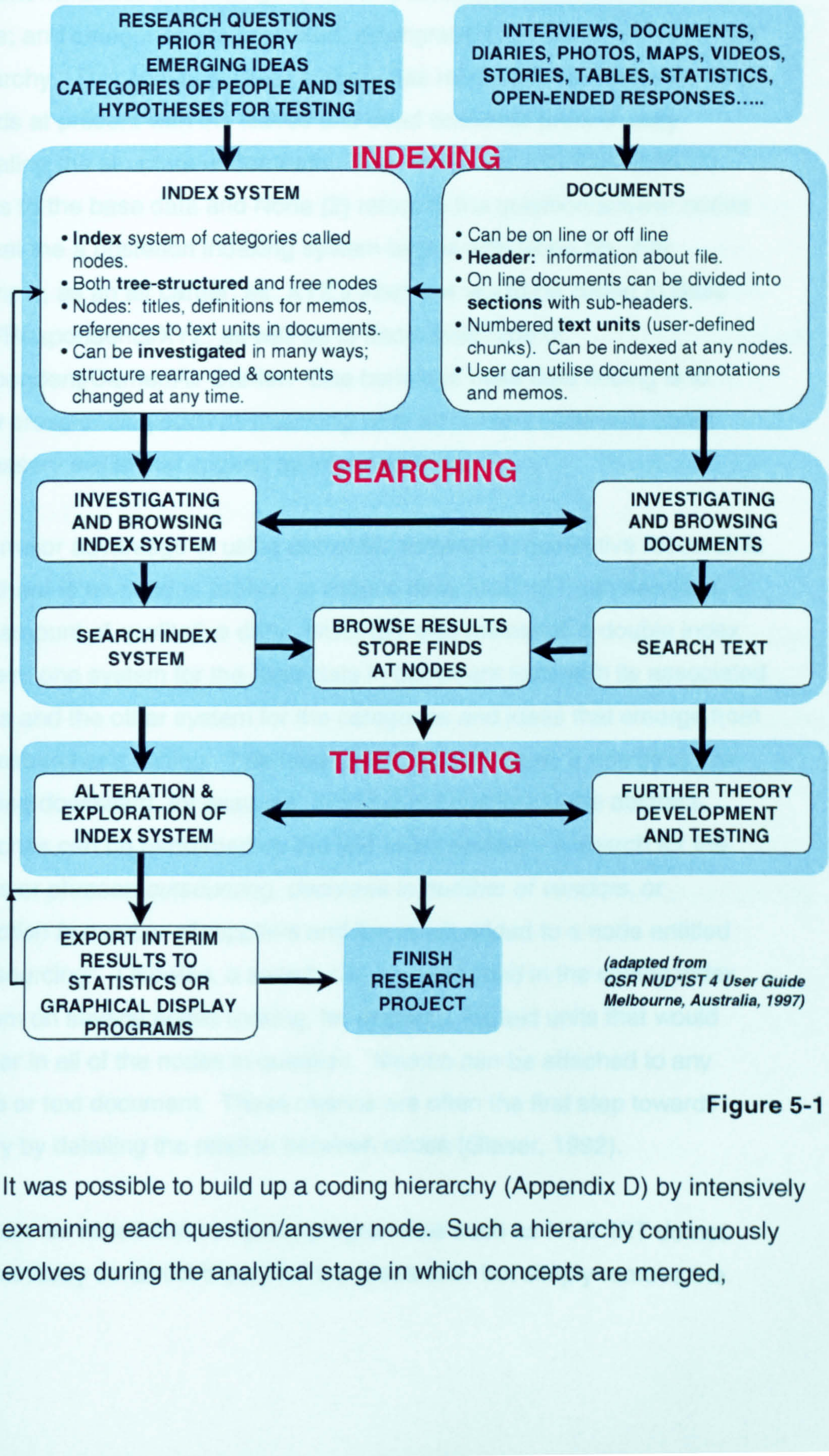


Figure 5-1

It was possible to build up a coding hierarchy (Appendix D) by intensively examining each question/answer node. Such a hierarchy continuously evolves during the analytical stage in which concepts are merged,

deleted, or created; labels renamed or redefined; memos about codes and documents added and changed; text and index searches lead to new ideas; and categories are promoted, downgraded, or subsumed within the hierarchy. This continual (tree) surgery has resulted in the hierarchy as it stands at present with the leaves and dead branches pruned away revealing the structure underneath. The reader will note that Node (1) refers to the base data and Node (2) refers to the question/answer nodes so that the a posteriori indexing system begins with Node (3). For example, as an air carrier, Mr. XYZ's interview would be coded to Base data/Respondents/XYZ, as well as to Base data/Type of Respondent/Carrier/Air Carrier. One benefit of base data coding is to allow cross-coding such as matching what all carriers have said about *necessary evil* to that spoken by intermediaries.

One major advantage of using computer software in qualitative research is that there is no need to jettison or reduce data; NUD*IST can handle a vast amount of qualitative data. NUD*IST also maintains a double index system: one system for the base data in document form with its associated codes and the other system for the categories and ideas that emerge from the researcher's coding. This hierarchical system forms a tree structure growing downward, for example, from the substantive to the abstract. Searches can be performed on the text index system – a search for the words or phrases *outsourcing, decrease in number of vendors,* or *reduction in number of suppliers* and the result added to a node entitled "Outsourcing". Likewise, a search can be performed in the coding index system on several nodes looking, for example, for text units that would appear in all of the nodes in question. Memos can be attached to any mode or text document. These memos are often the first step towards theory by detailing the relation between codes (Glaser, 1992).

It should be noted that computer programmes such as NUD*IST do not mechanically construct theory for the researcher but simply remove the

drudgery associated with qualitative research. The researcher's input is, of course, still necessary to make the conceptual leap from dialogue to code to concepts to theory.

5.3 Summary

This chapter has concentrated on *how* the first exploratory phase of the research would be carried out. As the intention of this phase was to explore the exchange relationships amongst the global logistics triad – forwarder, carrier, and shipper – a semi-structured interviewing technique was chosen. Questions were asked concerning the shared functions, roles, and relationships of the members. The respondents were evenly split between the three sub-groups and represented various transport modes, size, and product.

The resultant data were analysed using NUD*IST, a qualitative data analysis software package. This allowed the researcher to code the data and build conceptual frameworks from it while, at the same time, asking questions of the data and of the coding structure. Unlike most hand coded qualitative data analysis, there is no need to jettison or reduce data with computer aided packages.

The next chapter will examine some of the analysis that resulted from this first phase.

Chapter 6: QUALITATIVE DATA ANALYSIS: COLLABORATION AND CONFLICT

6.1 Introduction

"who goes there, friend or foe?"

Conceptually, when the shipper or carrier spoke of their relationship with the intermediary it was often in terms of a collaborator, a customer, or a competitor. Much of this organisational role conflict is manifested in the influences exerted by the intermediary, carrier, and shipper on controlling the global distribution chain as well as the division of functions carried out by the two upstream suppliers for the shipper. This is emphasised in the following analysis in which the fluctuating roles of the shipper, carrier, and intermediary are significant.

6.2 Functions

From the interview discussions it seemed that the changes occurring in function were more important than the actual functions presently performed by each of the three parties. And these conventional forwarding functions were viewed differently by airlines and ocean carriers. Traditionally, from the perspective of both the airline and the ocean carrier, the freight forwarder acted as the carrier's sales agent, handling the distribution of the carriers' products. However, while the air carrier may still see the forwarder as an agent, the ocean carrier might consider him a competitor.

> *Some of the recent thinking, which has been fashionable over the past ten years, has been carriers examining which functions they perform in house.*

...on the one hand (freight forwarders) are our agents and from our point of view they provide the distribution channel for selling our product. They provide the sales force which gets to the individual manufacturer and they are a very cost effective distribution channel.

...(freight forwarders) consolidate, they provide transportation services, which otherwise we would need to provide. They provide services which the carrier doesn't (such as) insurance, packaging, inventory management, pricing negotiation.

(Mr. S., air carrier)

..the carrier can do all the functions of a freight forwarder, but a freight forwarder can't do all the functions of a carrier.

(Mr. H., ocean carrier)

As suggested by Davies[1] in the early 1980s the traditional relationship between exporter, forwarder, and carrier in which logistics functions were clearly defined might be superseded by two other relationships. These were the forward integrated exporter who might take over some of the tasks previously performed by the freight forwarder and, less likely, the reverse integrated exporter who might outsource to the freight forwarder some of the tasks formerly kept in house (Davies, 1981c). However, as mentioned previously, while the traditional relationship still dominates, the major change in the relationship is the outsourcing of the shipper's in-house logistics functions.

What should (we, as a shipper), do ourselves? Should we stick to our core business and third party other things? ... Should we be dealing with individual lines?

(Mr. I. B., shipper)

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[1] see page 3-32

I see more and more (shippers), particularly large companies, saying 'we want to outsource the shipping arrangements as far as possible'.

(Mr. B., intermediary)

Shippers are willing to outsource logistics benefit in its broadest term and allow us to replace (their people) either with our people within their organisation or their people on our premises.

(Mr. K., intermediary)

...although we call them shippers, that is one thing they do least well. They didn't set up in business to become an exporting organisation. They set up to make something and to sell it.

(Mr. G., intermediary)

...at the moment we are trying to push the boundaries out to manage the supply chain. We're looking at where we can go with CIF, C&F, or DDU, so that we can have control. ... It's been frustrating using FOB but (for) UK exporters, selling FOB is historical.

(Mr. I. B., shipper)

Mr. B. was not implying that his company forward integrate into the forwarder's or ocean carrier's domain. Instead, he was suggesting that, through a change in terms of sale, his company could control *how* the goods were made available to their customers and could manage and observe their supply chain further downstream. Ocean carriers appear to understand and appreciate this:

Large, global, or multi-national organisations are looking for some visibility in control of their consignments, and that's where the value comes in over and above what the carrier would normally offer.

(Mr. N., ocean carrier)

Freight forwarders have expanded their service offerings downstream into the shippers' domain. At the same time global carriers, notably ocean shipping lines, have also extended their services downstream into the freight forwarders' traditional area of operations. It would be expected that this overlap of functions in which the downstream customer could also be a competitor might lead to friction (Dutta, Bergen, Heide, & John, 1995; Frazier & Antia, 1995). The air and ocean carrier, as well as the intermediary, seek to control this supply chain whereas the shipper, often as not, has rejected this obligation.

I see the intermediary extending their functional scope downstream (into the shipper's side). I don't see much scope for doing that upstream into the carrier's functions.

(Mr. G., intermediary)

...because the traditional demarcation lines between those areas of activity are starting to blur, and there's a lot of overlap ... the true definitions are starting to disappear now. The lines are blurred, companies will want to protect their corner...I think the intermediary has to change his shape, be a little bit more chameleon-like in order to fit the needs of the shipper. And I think the carriers also have to broaden their scope in order to protect themselves. Otherwise they will become very marginalised.

(Mr. N., ocean carrier)

...over the last 25 years there's been a movement by the airlines to extend their influence along the distribution chain and, in more recent times, to withdraw from it. One or two (air) carriers have wanted to extend that. ...KLM and some other carriers believe they need to have more control over the distribution chain and want to go directly to the manufacturer or consumer.

(Mr. S., air carrier)

Over the past few decades control has shifted from one party to another, generally away from carriers who have found their services becoming mere commodities. Adapting Davies' graphical representation of these relationships results in the following diagram of the change in functions:

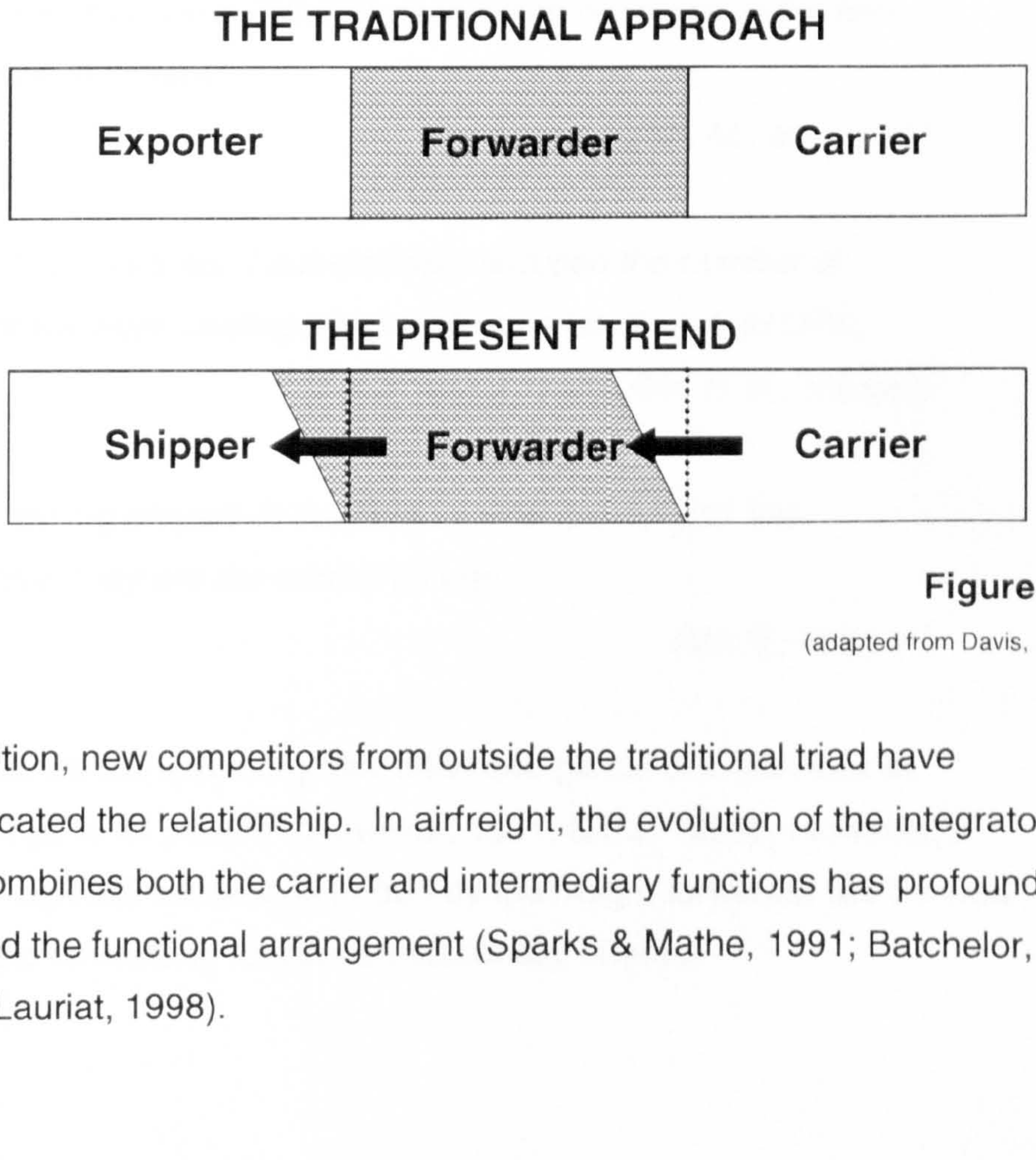

Figure 6-1

(adapted from Davis, 1981)

In addition, new competitors from outside the traditional triad have complicated the relationship. In airfreight, the evolution of the integrator who combines both the carrier and intermediary functions has profoundly affected the functional arrangement (Sparks & Mathe, 1991; Batchelor, 1994; Lauriat, 1998).

...how is the freight forwarder going to survive against the integrator because the integrator keeps going up the weight scale. Unless the airlines and (their) agents can hold hands, unless they get better track and trace, how the hell can you compete against with integrators?

(Mr. G.B., intermediary)

(In the express area)I can see the integrators advancing rapidly in dealing directly with shippers.

(Mr. J., intermediary)

The whole of (respondent's large global airline) has 52,000 employees and revenue of £7 billion (while) our freight operation has 2,500 people and revenue of £600 million. If you take UPS, they have 280,000 people and revenues in the tens of billions of dollars.

(Mr. M., air carrier)

About 2 ½ years ago I substantially reduced the number of carriers we were dealing with by giving a lot of work to UPS.

(Mr. S. B., shipper)

There are big players in the field ... who are not just the forwarder, they are the carrier as well.

(Mr. S., shipper)

The freight forwarder and integrator often see global 3PL services as being "all things to all people" (Hewison, 1991; Gillis, 1995). However, many of the logistics services provided by the freight forwarder are derived from the basic forwarding functions traditionally offered.

... a lot of what we call logistics services is actually done through the whole infrastructure of freight forwarding as we've always known it and liked it or loathed it.

(Mr. T., intermediary)

The functions performed by the new 3PL freight forwarder differ greatly from those offered by a traditional forwarder.

...anything that happens within the international trade function is a potential market place or should be a potential market place for a forwarder and the transportation is largely incidental. ... 75% of our revenue comes from consultancy and management services and 25% from forwarding operations.

(Mr. W., intermediary)

The carriers appear to want a piece of this logistics pie and, at the same time, avoid their services being turned into mere commodities. Thus, we see the ocean carriers forming 3PL companies, ostensibly at arm's length to their parent. And some airlines are attempting to compress the supply chain and deal directly with the shipper (Hastings, 1996a).

There have been a number of attempts by certain (ocean) carriers to say 'we can do everything for you', but their business and their investment is in moving ships and getting the best utilisation out of those vessels. ...the carrier maintains the schedules, has the capacity on the ships, and they run almost a bus service.

(Mr. C-S., shipper)

The emerging intermediary reinforces the carrier becoming an asset provider. He pushes back the expanding boundaries of the carrier.

(Mr. J., ocean carrier)

... one of the ideas (which KLM has) is to sell directly to major manufacturers and exporters (which) is effectively cutting out the middle man. That, of course, has created all sorts of problems for them because the middle man has reacted quite negatively.

(Mr. G., air carrier)

There's a lot of talk about carriers replacing the function of the intermediary.

(Mr. K., intermediary)

Possibly the dominant question shippers may have with carrier-spawned 3PL companies is whether or not these companies deal at arm's length or are controlled by their parent (Sheffi, 1990; Muller, 1992)[2].

(Transport asset owning 3PL companies) can only succeed - and I'm absolutely convinced of that - if they do it the same way that a few companies like Ryder have done. (That is) by treating it as a totally separate business. They can only do it by playing the two roles separately.

(Mr. H., intermediary)

...some of those forwarders who have been put in place by the shipping lines will say 'yes, we can use anybody we like'. However, the reason that these companies are formed is to

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[2] see page 3-31

generate cargo to be carried on their ships – there's no getting away from that.

(Mr. C-S, shipper)

Much of the interest in being perceived as a 3PL company for both freight forwarders and ocean carriers is to become the singular focus for their customers' logistics needs – the ubiquitous 'one-stop shop'. This is a popular idea – more so with carriers and intermediaries than with shippers (Muller, 1990; Buxbaum, 1994; Murphy & Daley, 1995; Semeijn, 1995; Semeijn & Vellenga, 1995; Richardson, 1996; Sink, Langley, & Gibson, 1996; Linn, 1998).

Big customers will say, 'I don't want all these fiddly bits, I don't want to distinguish between these three parties'. They just want one. Isn't that what most people want, they want one single point of customer or supplier contact?

(Mr. H., multimodal carrier)

(Freight forwarders) take away the hassle (for the shipper) of having to connect with all the different airlines. So they provide a pipeline that someone can go to – a one-stop shop (for connecting) to the airlines.

(Mr. G., intermediary)

Nobody is able to offer the whole process. Nobody (is) going to own everything. (As a customer) you wouldn't put all your eggs in one basket.

(Mr. J., intermediary)

There have been a number of attempts by certain carriers to say, 'we can do everything for you', but their investment is in

moving ships and getting the best utilisation out of those vessels on the best routes.

(Mr. C-S, shipper)

Therefore, the expansion of the forwarder's and the carrier's services downstream coupled with the utopian, and possibly premature, objective of becoming a one-stop shop for global logistics services is leading to conflict between carrier and intermediary. The difficulty for carriers, especially airlines, is that intermediaries such as freight forwarders make up a large percentage of their customer base (Malkin, 1992). When a company 'disintermediates' or bypasses a downstream customer in order to target that customer's customer conflict should be expected.

The importance of the actual function of freight transport differs considerably between ocean and air carriers. To the shipping line the act of conveying freight is, of course, critical. However, to the airline, cargo is often merely an adjunct – profitable to some – to the main business of moving passengers (Seideman, 1996; Pollitt, 1999). What becomes important for the air freight industry is the significance placed on cargo by the airline.

(Moving passengers) has always been the primary function or the major driving force for most of the airlines around the world. They are passenger-driven, they are passenger influenced.

The airlines say, 'Ok, fine. I'll let you have space for 10p per kilo', because he'd rather go with something than nothing.

(Mr. G., air carrier)

... 90% plus of all air cargo still goes on passenger airplanes.

(Mr. B., intermediary)

It's been passengers first and foremost.

(Mr. S., air carrier)

(Airlines have this) mindset that says 'we are a passenger airline and we carry freight as a sideline'. Somebody employed in cargo at an airline is somebody who did something wrong when they were in passenger because it's not viewed as a promotion.

(Mr. G., intermediary)

This (air freight) business is totally single-mindedly focused on moving passengers around the world.

(Mr. M., air carrier)

Of course, this "passenger first" philosophy only applies to the airlines; strictly cargo air carriers such as Flying Tigers (as part of Federal Express) would consider freight on the same level as ocean carriers (Khan, 1993; Wood, Barone, Murphy, & Wardlow, 1995; Pollitt, 1999). This approach by airlines to air cargo as by-product of moving passengers is one factor affecting the relationship between the intermediary and the air carrier. If airlines place little value on their cargo service they may find themselves conceding too much to the freight forwarder for whom freight transport is paramount. In addition, such airlines might not be expected to put resources into expanding their logistics offerings.

6.3 Role analogies

"I think we are defining these participants by what they are leveraging off. Their origins – what makes them unique – their fulcrum."

(Mr. J., intermediary)

The group names of the respondents – freight forwarders, carriers, and shippers – often become simply labels applied to more easily separate them. The key determinant of a pure freight forwarder used to be the offer of global freight transport with little or no reliance on in-house transportation assets. However, some forwarders own or control extensive networks of trucks or airplanes (Hewison, 1991; Cooke, 1993; Bowman, 1994; Gillis, 1995). Some global carriers, particularly in ocean freight, began to offer additional value-added services culminating in the creation of separate or in-house third party logistics firms (3PL) which offered many, if not all, the services offered by traditional freight forwarders. These new transport asset-owning intermediaries (TAO) differ from their non-transport asset owning brethren (NTAO). Sheffi describes NTAO intermediaries as those concentrating on people and (information) systems whereas TAO intermediaries are committed to using their own – or their parent company's – assets to move customers' goods (Sheffi, 1990). In addition to NTAO and TAO intermediaries, 3PL firms, and ocean shipping lines integrators have combined the conventional intermediary and carrier functions.

This overlap between carriers and intermediaries has not been reflected to the same degree with shippers. Certainly, shippers with in-house global transportation assets exist as do carrier/intermediaries moving into the ownership of the distribution:

> *Because there are businesses which are highly dependent on their logistics performance i.e., mail order companies - we are actually trying, not to go out and win an out-source contract, we just take over the whole company. And we'll just re-engineer its logistics*
>
> *(Mr. H., intermediary)*

As mentioned earlier[3], the use of metaphors encourages respondents to explain phenomenon in a different way in order to derive insights into the phenomenon (Beer, 1984; Tsoukas, 1991). Therefore, each respondent was asked to describe the relationships between the three participants in terms of a role-playing analogy (Appendix A - Question: 6). An interesting result was the general tendency of the carriers, especially air carriers, to either denigrate themselves or reduce themselves to mere commodity providers:

> *(I) see the key airlines as being like lions, just sitting around doing nothing most of the time. Just wandering about, not really knowing what they're doing and why. Ever so often they'll see something and they'll go for it. It'll keep them happy for a while, they'll chew on it for a few hours, and then they'll go back to doing nothing again.*
>
> *(Mr. M., air carrier)*

> *We've been gullible... (Air) carriers have neglected the business, under-invested.*
>
> *(Mr. S., air carrier)*

> *Slightly aloof...the parent standing a little away from what's happening...the fixed minded parent caught in a slack time warp not really understanding all that's happening.*
>
> *(Mr. N., ocean carrier)*

> *It's almost like we're (at) the supermarket and on the shelves there are various shipping lines.*
>
> *(Mr. W., ocean carrier)*

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[3] see page 5-2

Carriers were slightly less disparaging of freight forwarders - the terms 'intermediary' and 'freight forwarder' were used synonymously by most respondents. Descriptions ranged from "dying breed" and "predators or scavengers" to "amateur consultants with commitment".

Conversely, both intermediary and shipper respondents spoke (metaphorically) quite highly of intermediaries, either as a linkage, co-ordinating, or knowledge source. Linking and co-ordinating roles or functions imply centrality in the triadic relationship while knowledge roles or functions indicate the importance these respondents place on the need for the intermediary to filter or distil the information provided to the shipper.

Linking roles:

Provides the link between (the carrier and shipper) historically...

(Mr. K., intermediary)

....anything in the widest implication between a manufacturer and a purchaser.

(Mr. W., intermediary)

(Intermediaries) are the people who are buying and selling in the market place at either end of the (caravan) route.

(Mr. S. B., shipper)

(Intermediaries are) the chorus and they're there really to keep the (musical) ticking. They're there for when the star (the shipper's customer) has a rest or whatever, keeping the audience entertained, the procedures going.

(Mr. L., shipper)

(The intermediary is) like an estate agent. He is very much a middle man...

(Mr. S., shipper)

(Intermediaries) are the service and equipment link between the salesman and the company manufacturing the goods and the consumer receiving it.

(Mr. W., shipper)

Co-ordinating roles:

(The intermediary is) the conductor of the orchestra, setting the pace, defining the service, defining the quality of the sound.

(Mr. H., intermediary)

(The intermediary is) a kind of facilitator, they make it happen.

(Mr. T., intermediary)

The freight forwarder is the station master. (He) would make sure that there's the right train on the right track.

(Mr. C., Shipper)

Knowledge roles:

...but today, (the forwarder) provides the database that allows the (carrier and shipper) to link.

(Mr. K., intermediary)

(The intermediary has) the role of a sourcing agent to us. ...a knowledge agent.

(Intermediaries are) knowledgeable conveniences. They're essential if you (appreciate) the fact that I haven't got time to go to carriers all the time. I want to talk to one (forwarder), I want

to focus on one person, one focal point, and he's going to do the whole (move) for me.

(Mr. S., shipper)

The forwarder and carrier are comfort zones for exporters and importers.

(Mr. W., shipper)

There was one interesting exception to this continuous endorsement for intermediaries and that came from one respondent who *is* an intermediary:

The net in the middle (is) the guy who is going to stop you actually winning the game. Worse still, he's actually going to charge you for stopping the ball. ...The net, unfortunately, is about 12 feet high, made of bricks, and it moves!

(Mr. G., intermediary)

Mr. G.'s background was with exporting companies and his present company had moved substantially away from the traditional forwarder role into that of a contemporary provider of global logistics services. He was speaking not of his present company but of the traditional forwarder as one who adds little value to the relationship.

When discussing carriers, the intermediary and shipper respondents often described them as commodities:

Musicians in the orchestra...

(Mr. H., intermediary)

...you have people in the orchestra who want to be in the orchestra but they also want to be the conductor.

(Mr. J., intermediary)

(A carrier is) a person or organisation that operates modes of transport.

(Mr. K., intermediary)

(In a desert caravan, carriers) are the camels. ... I would certainly like to see (the camels) becoming a bit faster and cheaper.

(Mr. S. B., shipper)

(In a musical, carriers are) the background people, the lighting people, the sound people. They're there to provide the infrastructure for the others to achieve what they want to achieve.

(Mr. L., shipper)

(A carrier is) the same as a factory.

(Mr. S., shipper)

...the relationship between us and the carrier is almost (like) a bus. As long as we can get the goods via the freight forwarder onto that particular departure, and it flies, or the ship sails, that's the relationship.

(Mr. C., shipper)

The descriptions of the shipper's place in these role analogies resulted in the greatest divergence. They were often described at polar extremes of (supply chain) control as passive or dominant, perhaps reflecting the widely varying expertise and knowledge within exporting and importing organisations:

Passive:

...manufacturers (and) retailers just sat there.

(Mr. H., multimodal carrier)

(The shipper) has been passive.

(Mr. S., air carrier)

The shipper should be the conductor but he doesn't want to be. He should be picking out bits in the orchestra that he needs. The shippers are lazy; (supply chain management) is not their prime function. Even when a company employs a conductor he goes out and employs another conductor which he shouldn't do. But he actually wants a quiet life.

(Mr. J., intermediary)

(In a desert caravan the shipper is) the Caliph sitting in his palace just transferring his valuables from one part of the empire to another. He doesn't want to come down into the market place and see the camels or be involved in any of that thank you, not interested, just so long as it gets from Ajaz to Mecca, that's fine.

(Mr. S., shipper)

Dominant:

(As greyhounds) they can see what they've got to do and they're going for it as much as they possibly can.

(Mr. M., air carrier)

(The shipper) is focusing on trading in the correct markets.

(Mr. J., ocean carrier)

(The shipper is) the dominant force in the (family) relationship.

(Mr. N., ocean carrier)

(The shipper is) the essential ingredient as the originator of the freight.

(Mr. B., intermediary)

(The shipper is) the composer of the music so he defines the beginning and the end and what kind of tune he wants to hear.

(Mr. H., intermediary)

(The shipper is) the driving force

(Mr. I. B., shipper)

...we control the signals. We set the tracks and signals right.

(Mr. C., shipper)

In summary, the role analogies placed the intermediary, when not spoken of disparagingly, in linking, co-ordinating, or knowledge roles; the shipper in passive or dominant control roles; and the carrier in a commodity role.

6.4 Relationships in the triad

There may well be with shipping companies the tendency to continue to endeavour to get major contracts for themselves – cut the freight forwarder out of the equation. Airlines, definitely no. Airlines do not have the infrastructure. There is no way the airlines would be able to do that.

(Mr. B., intermediary)

Modal differences in centrality were evident. Centrality is the 'degree to which relations are guided by the formal hierarchy' (Tichy, Tushman, &

Fombrun, 1979). Freeman defined network participant centrality in terms of three concepts:

1. *degree* – being the object of many relations,
2. *betweeness* – being in the middle of paths that connect others,
3. *closeness* – having immediate access to others who are connected (Freeman, 1979; Nohria, 1992).

With centrality goes power, often through control of information (Boje & Whitten, 1981; Bonacich, 1987). Question 4 asked the respondent to provide a simplified sociogram-type diagram in which the triadic members were represented by points and the relationships between them by lines (Moreno, 1934; Scott, 1991). The resulting diagrams were combined graphically and fed back to each respondent (Appendix E).

In general, the intermediary is considered more central than the other two parties. However, there are modal differences involving the intermediary's place in the triad. With airfreight, the intermediary is perceived as being more central than with ocean freight. The explanations are various but, in the main, evolve from a decision made when the larger jumbo jets came on-stream increasing freight capacity enormously. It was suggested by several respondents that these aircraft, while doubling the previous aircraft generation's passenger load, also offered a ten-fold increase in cargo lift. In the early 1970s the airlines 'sold their birthright' by inviting freight forwarders to handle their sales. Airlines were in the business of moving passengers, not freight, and did not want to create and maintain the infrastructure needed to offer door-to-door freight services.

> *...everything stems back to the selling of our birthright, in which freight forwarders became the agents for selling. That's when basically the whole thing became totally commoditised in my view. So (this change) has driven everything that happens now...*
>
> *(Mr. M., air carrier)*

The 'mess of pottage' airlines acquired for their birthright has created this dilemma: as freight customers, intermediaries are very important to air carriers - as distribution channel operators they may compete with the airlines in dealing directly with shippers. As middlemen, airfreight forwarders control the triadic relationship, often excluding the air carrier from any sort of contact with the shipper:

I'm invisible (to the shipper). ...the shipper doesn't get to talk to the airline. ...because there isn't (a relationship with the shipper). I'm just saying, the shipper might try to get to the airline but can't.

...it comes down to a group of people who are willing to provide a service and there is a need for a middle man to be able to provide that service. Airlines can't – they've never been able to do it and they never will because of the cost.

(Mr. G., air carrier)

I've yet to see the day when I've had somebody from British Airways or Virgin or American Airlines come and knock on my door and ask for my business. If they do so I'll be very happy to sit and have a chat with them and see what they have to offer, but that hasn't as yet happened...

...my relationship is almost totally with the forwarder.

(Mr. S., shipper)

(The air carriers) don't actually come with the forwarder, it isn't a joint visit, but what they've normally done is inform the forwarder that they are coming to see me.

(Mr. L., shipper)

> *So I don't talk to carriers. And I imagine that (the forwarder) is not dealing with just one carrier, they're dealing with a number of others so long as they can keep me happy.*
>
> *(Mr. S. B., shipper)*

The graphic results are similar to those provided verbally in the interviews. In linking or co-ordinating roles, intermediaries are highly central within the triad. When modal differences are considered, airlines are further from the centre than ocean shipping lines. With shippers, centrality is at the polar extremes reflecting the roles offered by the respondents: dominant, with strong centrality or passive, on the centrality outskirts of the triad.

6.5 Summary

The position of and functions performed by the intermediary have changed dramatically over the past few decades. With the growth in airfreight came the change in the intermediary's capacity from that of an agent, merely bringing together a shipper who needed a service with the carrier who could provide it. The forwarder became a principal who, to all intents and purposes, *was* the carrier and accepted responsibility for the total freight movement. This change in status and function is reflected in the relationship the freight forwarder has with air and ocean carriers. As the original suppliers of freight services to global companies, shipping lines may still consider the freight forwarder as an interloper. With the advent of shipping line-derived 3PL companies and the promotion of LCL cargo the freight forwarder became more of a competitor to the ocean carrier than a customer.

However, to most airlines the freight forwarder is more than a customer. He provides those intermediary services that, together, make the airline and forwarder a direct competitor to the integrator. It is the integrator in airfreight that pushes the airline and freight forwarder together.

Conversely, it is the 3PL company (along with containerisation and the increasing importance of LCL cargo) that pulls the ocean carrier and forwarder apart.

The intermediary was characterised in the roles of linking the shipper and carrier, of co-ordinating the freight movement, and of being the seat of knowledge for all aspects of global freight transport. Carriers tended to be described as commodities, suggesting price may be the major way to compete in global transport. Shippers seemed to take two opposing roles. Either they were passive and willing to sit back and let the forwarder (in most cases) handle the work or they were dominant and took a direct role in the movement, especially if ocean freight was involved.

The relationships amongst the three sub-groups appeared to split on modal grounds. The forwarder was far more central in airfreight with the airline further away from the forwarder/shipper dyad. In ocean freight the shipping line was much closer to the shipper. These findings from the test were backed up by the sociograms drawn by the respondents.

Chapter 7: Customer, competitor, or collaborator: The 3Cs?

7.1 Introduction

Modal differences are prominent in the relationships amongst the three parties in global freight transport. How do the shippers and carriers – air and ocean – view the freight forwarder? And does this view differ by transport mode? The following chapter examines the perceptions of the respondents as to who the intermediary is and what does he do.

7.2 Perception of the intermediary

Generally carriers, again especially air, are perplexed by who the intermediary is in relation to themselves.

> *The relationship between the forwarder who is not adding value (and the carrier and shipper) is a strange one. It's almost a Mexican stand-off where you have the carrier, particularly an airline, who's very nervous about approaching the shipper because they are worried about the short-term impact on themselves which, after all, (concerns) a very perishable commodity. Whereas, on the (ocean) shipping side the lines have built much stronger relationships with the shippers themselves...*
>
> *(Mr. J., intermediary)*

Much of this perceived 'schizophrenia' may have come about through the intermediary's ability to reinvent himself over the decades. As stated earlier, such chameleon-like changes mirror those in the industry's own umbrella organisation: from the Institute of Shipping and Forwarding Agents to the Institute of Freight Forwarders to the present British

International Freight Association (BIFA) we can see the gradual change from 'agent' to 'forwarder' to the generic 'international freight participant'[1].

Carriers regard the intermediary in one or more of three roles: as a customer, as a collaborator, or as a competitor. As a customer, the freight forwarder is, to air carriers especially, extremely important, making up much of their customer base (Malkin, 1992). As a collaborator, the freight forwarder's traditional origins as an agent fulfilling the sales distribution function for the carrier are now reflected in the modern trend towards uniting with the air carrier against the integrator onslaught. As a competitor the freight forwarder's linking and knowledge functions influence the decision on carrier choice. This ability to switch carriers coupled with the carriers' reluctance to 'go behind the forwarder's back' and deal directly with the shipper makes the forwarder a natural competitor to carriers.

7.2.1 Role of customer

Considering the intermediaries as customers, air and ocean carriers look for a broad base of forwarders, both large and small, and with both durable and transient exchange relationships:

> *...(air carriers) also want a good broad base, smaller forwarders, losing one of which would not harm their business, so having a lot of them adds to their business, and tends to produce high yield. So that mix of business is extremely important and you want people who are stable and you want people who are unstable. You want unstable relationships, because they enable you to move market share.*
>
> *(Mr. S., air carrier)*

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[1] see page 2-11

I still believe that companies tend to want to have a range of base cargoes, so that requires long term relationships. But that's not in all cases. I mean you still need to top up, you still want to have smaller companies on all your ships or on your aircraft because they tend to be paying the higher rates.

(Mr. N., ocean carrier)

Intermediaries realise that their own customer-shipper is the carrier's customer, not themselves:

> *You don't act as the perceived customer to the airline or shipping company and bang the table and jump up and down. Because the more you upset these guys - I mean how many options are there on particular routes? When you want space or rates he is going to stitch you up or say bugger off.*

> *...(the shippers) are the owners of the freight and it is their business even though the freight forwarder puts himself forward as the customer of the airlines. Let's face it - it's the shipper who actually owns the freight. And you always represent the shipper when you present the cargo to the carrier.*
>
> *(Mr. B., intermediary)*

> *It's a bit of the ritual dance that the carriers treat the forwarders as if the forwarders were the customer. (When I was a shipper) I (was) paying the money so how come this is the guy that gets all the attention because in the final analysis it's the shippers requirements, or more importantly, the shippers' customers' requirements that have to come to the fore?*

The carrier regarded the forwarder as being the man with the money so he becomes the customer.

(Mr. G., intermediary)

7.2.2 Role of competitor

As with many channel intermediaries the forwarder faces being by-passed by his suppliers or customers. Ocean carriers consider freight forwarders as *present* competitors to their buyer-seller relationship with shippers.

A forwarder is always looking for the last dollar, a shipper may be looking a little bit more forward than the freight forwarder.

(Mr. W., ocean carrier)

More generally (the relationship) is between the (shipping) line and the forwarder because the forwarder will invariably sell on, have a selling rate which will invariably be perhaps $200 higher than the rate that he buys off the line, which is where the line has the drawback because it loses money - it could sell direct to the shipper at a rate which is higher...

With the types of organisations (forwarders and ocean carriers) both have, you will not fail to have those times where you've come head to head with the freight forwarder because you both have a sales organisation of your own. And those sales organisations, in their attempt to bring up new business, will always come head to head. There will always be the chance that the shipping line will, perhaps, unbeknownst to the other side of the Atlantic, make a quotation that has not been passed back to the freight forwarder and therefore, has under-quoted the freight forwarder...

...freight forwarders have been able to come in and undermine the relationship (the shipping line has with the shipper) over a period of time, thus undermining the rate structure, if you like, that the shipping line may have had. The freight forwarder will come in and remind the shipper that there are another 65 options and has he ever considered one.

(Mr. H., ocean carrier)

Similarly, air carriers consider freight forwarders as *potential* competitors unless already explicitly targeting shipper-customers:

It has always been perceived by the airlines that the middle men rip off the shippers.

(Mr. G., air carrier)

This is the airlines' minefield (the interface between shipper and carrier) that you mustn't cross. If we try and get beyond there it's a minefield.

(Mr. M., air carrier)

There's KLM. They are very aggressive in the way that they have said, 'We will talk to shippers because if we are going to direct our services and make major strategic changes to the way that we organise ourselves we want to do that on the back of the people who control the money, not the people who act as an intermediary'.

(Mr. G., intermediary)

Whenever dual channels of marketing co-exist there is the capacity for customer-competitor dilemmas (Frazier & Antia, 1995).

Intermediaries and shippers also recognise the competitive conundrum the former face:

> *Even if (a forwarding-based organisation with their own aircraft) gives (the freight manager of a major airline) $50 million worth of business and the bloke cuts across his path the manager could say 'Stuff you! I might go and talk to your customers because I think you're also a competitor as well as an agent'.*
>
> *(Mr. B., intermediary)*

> *The air freight forwarders are quite powerful so they might look a bit irritably at the airline going straight to the company and they would probably try to discourage it.*
>
> *(Mr. W., shipper)*

7.2.3 Role of collaborator

In this research the term 'collaboration' is used generically to cover co-operative associations at the alliance or partnership end of the relationship continuum. Semantically, partnerships are more vertical relationships in which the supplier is considered an extension of the customer. Alliances are more horizontal relationships in which the partner is viewed as creating value within the firm's value chain (Peck, Payne, Christopher, & Clark, 1998). Many logistics researchers consider a partnership as that between channel members (Pollack, 1995; Ramsay, 1996; Tate, 1996; Ackerman, 1996). However, both the terms 'alliance' and 'partnership' are used to describe the co-operative relationships between competitors (i.e., R & D). Collaborative alliances remove the unspoken weight of buyer versus seller because, in addition to a common customer, the collaborative pair may have joined together to fight a common enemy. Alliances come about when organisations realise that they have a mutual customer *and* a mutual competitor. By making this customer and competitor the focus the alliance

partners can work together collaboratively. Such an alliance is epitomised by the evolving co-operative relationships between airlines and freight forwarders in which the integrator is the common enemy (Bradley, 1992; Canna, 1992; Turney, 1997).

Collaboration between carriers and intermediaries, whether it be alliances or partnerships, was discussed frequently by all respondents. The qualitative content analysis matrix below indicates the number of text units (lines of text) that were coded to each of the industry groups for the three roles: customer, collaborator, and competitor. Descriptive words sought for *customer* included buyer, customer, and purchase; for *competitor* these included compete and various military words such as battle, enemy, or fight; for *collaboration* these included alliance, partnership, co-operation and their permutations and synonyms. The reader will note that intermediaries and carriers spoke relatively more about these roles in terms of these descriptors than did shippers whereas carriers spoke relatively more about collaboration than did intermediaries.

RESPONDENT TYPE VERSUS CUSTOMER, COLLABORATOR & COMPETITOR

	Intermediary	Carrier	Shipper
Customer	163	150	23
Collaborator	57	147	54
Competitor	110	86	74

Table 7-1

Another matrix was created by eliminating intermediaries and shippers and separating the carriers into ocean, air, and multi-modal and matching their lines of text to the same three role-descriptors:

CARRIER TYPE VERSUS CUSTOMER, COLLABORATOR & COMPETITOR

	Ocean Carriers (4)	Air Carriers (3)	Multi-modal Carrier (1)
Customer	47	74	29
Collaborator	0	141	6
Competitor	25	61	0

Table 7-2

The reader will appreciate that the number of carriers doesn't correspond by mode (four ocean/three air/one multimodal) and therefore the numbers of text units coded both to respondent group and containing the descriptor word(s) are moot. However, it is interesting to note that ocean carriers did not speak of *any* descriptor associated with collaboration (0 lines of text) whereas to air carriers it was dominant (141 lines of text).

The discussion of airline collaboration with intermediaries has arisen from a number of factors besides the general business trend towards stronger inter-firm relationships with fewer suppliers (Harland, 1996; Stump & Sriram, 1997). As stated earlier, airlines 'sold their birthright' to the forwarders in the 1970s because the explosion in freight capacity due to jumbo passenger aircraft forced them to react quickly and fill their empty (aircraft) bellies.

> *...because now suddenly there is a 400 tonne aircraft which is going to take off from London with 400 passengers on board that has the capacity to carry twenty tonnes of cargo, so 'hey cargo, come on, you've got to fill it'.*
>
> *(Mr. G., air carrier)*

...in the early 70's the airlines sold their birthright for freight to freight forwarders because overnight we had the 747 and the airline doubled its passenger capacity on a given route with a 400 seat plane but multiplied the volume of cargo (ten-fold). ...we're having enough trouble working out how to fill these wonderful huge planes with passengers, let alone working out what to do with the cargo.

(Mr. M., air carrier)

By relinquishing their control over the marketing channel the airline has transferred power to the intermediary (Weitz & Jap, 1995). In addition, the phenomenal growth in integrators has removed much of the smaller, time-delineated express freight from airlines (Bradley, 1992; Hastings, 1993; Bowman, 1994). The integrator has become the mutual competitor for airlines and intermediaries.

Because without both of us moving down the same road, we're never going to compete with the integrator.

(Mr. G., air carrier)

(Forwarders) are much more vulnerable than the integrators. That's why they're starting to get into bed with airlines and starting to talk about partnerships.

(Mr. S., air carrier)

We really view our relationship with (air carriers) as partnerships. The most competitive people we've got are integrators. ...if we are to compete successfully with integrators, we really do have to have a very good working partnership with carriers.

(Mr. T., intermediary)

Because in simplistic terms, the carrier plus ourselves are a direct competitor to the integrator. I mean it's taken a while for some carriers to recognise that but it is a commercial fact.

(The power of integrators) will drive a relationship between the carrier and the forwarder.

(Mr. K., intermediary)

So therefore, if we are to compete successfully with integrators, we really do have to have a very good working partnership with carriers.

(Mr. T., intermediary)

The trend towards collaboration is not due solely to the threat of the integrator and the desire on the part of airlines to reclaim control of the marketing channel.

...the major airlines have tried to secure some form of a contractual agreement with major global freight forwarders so that there is more of partnership than just an agent giving an airline business as and when he chooses.

(Mr. G., air carrier)

Collaborating with major intermediaries in the form of alliances (or partnerships) would help the airlines reduce the indecision involved with selling a perishable product on a discrete, transactional basis.

There has been a call for more collaboration between freight forwarders and carriers from intermediaries and shippers as well:

(Carriers and intermediaries) should never compete, they should collaborate. If they start to compete they'll get confrontational; if they collaborate then it works very well...

(Mr. W., shipper)

But we're not (integrators). We, as freight forwarders, are reliant on the airline or shipping company to move it to destination.

(Mr. B., intermediary)

In 1995 the CEO of a large global intermediary described his company's collaboration with airlines as arrangements with ""preferred carriers on a commitment basis" rather than transactional (Malkin, 1996).

7.3 Summary

In summary, the global freight intermediary has taken on the multi-faceted roles of customer, competitor, and collaborator to his carrier audience. Airlines and shipping lines both want a varied forwarder-customer base comprised of large and small forwarders. Transport modal differences arise where ocean carriers view intermediaries as present competitors whereas air carriers, due to the intermediary's stronger customer and marketing channel positions, consider them more as potential competitors. Only airlines appear to discuss collaboration with freight forwarders to any degree. The reasons for this collaboration may be to avoid bypassing the intermediary and competing with an important customer or to join forces in combating the integrator.

Chapter 8: THE POSITION OF THE CARRIER: AN IDENTITY CRISIS

8.1 Introduction

In one direction carriers are moving towards 'disintermediating' the freight forwarder - removing the intermediary from the channel (White, 1988). In the other direction they are discussing collaboration to serve a common customer and fight a common enemy. Without the integrator as a mutual enemy ocean freight is pulled more towards the competitive side of the relationship:

> *By and large you could trust (the airlines) not to stab you in the back with the shipper. Shipping companies you can't say that (about). A lot of shipping companies will go out of their way to do a deal with a shipper direct. There is this rivalry and this mistrust generally between freight forwarders and shipping companies (ocean carriers). You have to use them.*
>
> *(Mr. B., intermediary)*

Generally, the airline's more complicated position differs from that of the ocean carrier. Certain consignment parameters which affect these positions have their counterparts in both air and ocean.

8.2 The air carrier

Cargo strategy within airlines appears to be influenced by at least three factors:

1. the level of commitment from intermediaries and shippers
2. the status of freight with the airline
3. the customer mix - nominally freight forwarders due to their predominance

In addition, a fourth factor – available freight capacity – not only influences cargo strategy and the relationship airlines have with freight forwarders but also affects these three factors above.

The level of commitment is embodied in the degree of fulfilment of permanent bookings (PBs) made by the airlines' customers. Intermediaries and those shippers who deal directly with the airline secure space on a regular and continuous basis. However, there is little penalty for the intermediary or shipper who doesn't fill this voluntary space quota. The only recourse the airline has to reduce the booking allotment in the future.

The commitment level of intermediaries is implied by the level and type of bookings made by them with the airlines:

> *(Information) revolves around two things: one is what we call PBs, where people make bookings, permanent bookings, and they commit to space. PBs are a total nightmare. With passengers, PBs are block bookings. There have very tight constraints around them. They're bought up front, let's say by Thomas Cook, and they have windows of opportunity when they can give them back at different prices. Basically at the end of the day if they don't fill them then they lose the money because they've bought them. In airfreight it doesn't work that way. People making commitments have a PB. If they don't show up with any freight all, it's not an issue, they don't pay for it, we just fly empty.*
>
> *(Mr. M., air carrier)*

> *But the whole industry is based on making bookings and if (the forwarders and consolidators) don't use it, tough. The re-dress (we) have is to cut down (their) capacity because they're given*

blocks based over a period of time or we give them a permanent booking over a period of time and if they don't use it we cut them down. A lot of studies in my previous company indicated that, on average, utilisation doesn't get much above 50-60% for most forwarders. And there's no penalty. But then, passengers make a reservation with two or three airlines for ticket on departure and they don't turn up.

(Mr. S., air carrier)

Your major consolidators will book space and there was an attempt by some major carriers to get contracts operative in the industry (but) it largely failed. There may be voluntary commitments on space, tonnage, and time by some of the major consolidators with some of the major carriers but I consider it very much an ad hoc market.

(Mr. W., intermediary)

If you look at (our) relationship with travel agents, deals are struck up front and commitments are made. As a result of those commitments that are made, (we) make decisions and plans. Whereas in the freight business we don't have that luxury, so therefore there's no actual relationship between what is likely to come through the door on a given day and what actually happens. The predictions are very hard to make.

Things moving around the world are not random. Carriers have to respond to a random distribution of things walking through the door on a given day. And it is totally random. But the world isn't random...

(Mr. M., air carrier)

With, at best, voluntary commitments from intermediaries, airlines have great difficulty in forecasting freight usage. Their product is space which is time constrained and highly perishable. Agreement on a voluntary basis to purchase such a product suggests that if these commitments are not settled before the product 'expires' the airline will be left scrambling to fill its hold.

You can understand why (the airlines) are easily persuaded. Because they've got capacity, it's highly perishable and if they don't sell it they go empty and you can never get the space back. So they're usually panicking to get business,

You don't know exactly how many people are going to use the standard permanent booking which you know is in the system. Only in the last two days when the curve goes up towards the end does it hopefully go to full, 12 hours before departure.

(Mr. S., air carrier)

It is perhaps fortunate that full-service global airlines do not depend only on freight. Freight transport is a poor second cousin to passenger transport. Because freight is not considered as important as passenger transportation, fewer resources are made available to the cargo department and less is expected of it. For those airlines, such as KLM, for which freight transportation is very important the resultant focus on the freight customer can exclude even the freight forwarder.

(Additional passenger capacity) puts pressure on the people that have cargo to move from Europe to the United States, and that means that then there's a downward spiral of (freight) rates because suddenly instead of two flights a day, you've got six flights a day to (a large American city).

(Moving passengers) has always been the major driving force in most of the airlines around the world. They are passenger driven, they are passenger influenced.

Passenger demands don't necessarily reflect the cargo demands. Just because you think you can fill an airline with passengers doesn't necessarily mean you can fill it with cargo, but we are told to do it.

(Mr. G., air carrier)

...it really is very hard to actually get cargo at the right level on the board (of directors') agenda.

This business is totally single mindedly focused on moving passengers around the world and influencing that angle of moving real people around, not boxes. We do boxes because it's an important part of the business and yes, we think we'll be good at it but I fundamentally question whether or not a company like (ours) that in relative terms (relative to the global integrators) is so tiny, should really be worrying itself with all this stuff.

(Mr. M., air carrier)

The importance of freight to a passenger airline affects its position vis-à-vis the intermediary:

I put all airlines into 3 groups. You have (major global air carriers) companies who are very very serious about their freight and for whom it's part of the board agenda or it's part of the agenda of the direction of the company. You then have those airlines that are good quality airlines but are really in to fill up. It's not a crucial strategy to them but they offer a very good

service, a key competitor. They're seeing it as being top up because it's not fundamental to the decisions they make but it's actually something on which they offer a very good service. And then you have the bottom line (carriers) which are basically the very bad ones, who basically have got space, they sell it off very cheap, the service is atrocious.

You must split the airlines (by) freight operators - serious guys and less serious. I see the freighter guys having contact with the shipper. I think what KLM is doing is right. The by-product airlines will go (through) the freight forwarder.

(Mr. J., intermediary)

Those 'by-product' or 'top-up' airlines for which freight ranks a weak second to moving passengers will continue to regard the intermediary as the customer. However, those 'freighter' airlines for which freight is serious business will consider by-passing the intermediary to reach the shipper-customer.

But I do believe these three (major global air) carriers really are exploring different ways at the other end (from) total commoditisation which is just to fill up space.

I think if you take away that bottom one (airline), they've got a crucial role to play because they keep the price down. You then have these other two groups and I think that it's the first (serious) group that is the one who is going to start to change the industry.

(Mr. M., air carrier)

What might change is a greater relevance being put onto cargo as a means of earning money rather than as a top up for

passenger aircraft, which is a whole different shift within the industry. I see that with certain carriers who have obviously decided to take that route and that's simply because the passenger capacity is no longer great enough to carry the massive amount of freight that needs to travel. Equally, more and more shippers are saying that it's not acceptable to have to wait on a schedule that satisfies a passenger when you're talking about freight which in its own right is a business and has its own specific requirements.

(Mr. G., intermediary)

The airline's customers are mainly freight forwarders. The mix of large and small forwarder-customers constitutes the airline's customer portfolio. Large customers offer stability and regular, albeit, low-yield returns. Small customers are transient and offer higher-yield returns. This mix of large and small is important to the airline to maximise revenue and market share; airlines welcome dealing with a diverse portfolio of customers.

I think there are going to be people who, once you build a relationship with them, it takes dynamite to sever that relationship, but once it's severed you never get them back. So you need some of those people for your base business. There are also people who will move for a penny cheaper but, if they'll move away from you for a penny cheaper, then they'll move back to you for something else. So you want some of those people as well so you can manage market share.

(Airlines) want to deal with perhaps the top twenty forwarders and they might want that to consume 30-40% of their business, ideally. Then they've got a smallish middle group who are niche players, who are strong in one country or in one lane segment or in one trade, and they want to deal with some of those. They

also want a good broad base (of) smaller forwarders which tends to produce high yield, losing one of which would not harm their business. (On the other hand) the big relationships with a small number of large forwarders tend to produce low yield. So that mix of business is extremely important and you want people who are stable and you want people who are unstable. You want unstable relationships, because they enable you to move market share.

(Mr. S., air carrier)

The large intermediaries offer stable, committed relationships but low yield. Moreover, the smaller firms provide higher yield but with more unsettled relationships.

Portfolio models in marketing have been discussed in the wider context of portfolio theory (Turnbull, 1991). The International Marketing and Purchasing Group (IMG) suggested the interaction approach in order to study buyer-seller relationships from which, in turn, were derived portfolio models of supplier and customer relationships (Hakansson, 1982). In the same book, Cunningham's interaction approach to a portfolio model of customer relationships considered both short-term (operational) and long-term (strategic) aspects of the customer relationship (Cunningham, 1982a). He categorised these relationships resulting in a portfolio of yesterday's customers, today's regular customers, today's special customers, and tomorrow's customers. The portfolio of freight customers accepted by airlines appears to offer a mix of yield and stability - an attempt to maximise profit and minimise risk.

For sellers, Krapfel et al suggest the following procedure to match buyer-seller relationships to the management mode within a portfolio of customer relationships:

1. Determine the relationship type with the buyer in terms of economic value and mutuality (*Typing* along the dimensions of economic value and interest commonality).
2. Choose a management mode against the seller's position of power vis-à-vis the customer (*Mapping).*
3. Compare the management mode with the relationship type (*Matching*).
4. Communicate in order to achieve equilibrium (*Signalling*) (Krapfel, Salmond, & Spekman, 1991).

I see the forwarder as being a more fickle market place in terms of commitment to any carrier. With the increased competition, particularly from the Far East carriers likely to woo forwarders away from traditional airlines because of rate issues, I can well understand (major global air carriers) attempting to secure a much more stable base line of traffic from major shippers direct.
(Mr. W., intermediary)

This desire to obtain a stable base of customers within their portfolio coupled with a perceived unbalanced power position may require the airlines to seek direct dealings with shippers.

These three aforementioned factors – the level of commitment from intermediaries; the status of freight with the airline; and the portfolio of intermediary-customers – affect the balance of conflict and collaboration between intermediary and airline. A mix of customers that is more dependent on smaller, ad hoc, non-committal forwarders could destabilise the relationships and the power balance of the airline encouraging conflictual response. In turn, a customer portfolio in which larger intermediaries and stronger, more committed relationships dominate could bring a collaborative response from the airline.

Similarly, the approach taken by the airline towards freight is reflected in this balance of conflict and collaboration. As mentioned, those 'by-product' or 'top-up' airlines for which freight is very much subordinate to passengers will continue to work with the intermediary. However, those 'freighter' airlines who take freight seriously could either build alliances with major intermediaries (collaborate) or by-pass the intermediary (conflict). It may even be possible, albeit difficult, to attempt both.

8.2.1 Freight capacity: the ebb and flow of power

These three organisational factors affect the balance of conflict and collaboration between the airline and the intermediary and, in turn, are affected by freight capacity within the airfreight industry. Freight capacity, especially route specific freight capacity, is perhaps the single most important factor affecting the relationship between the airline and its customers. If cargo space is not available or is difficult to find on a particular route the forwarder will be more likely to commit to permanent bookings, evincing loyalty. The forwarder would also try and partner with the airline in order to ensure space will always be available for him.

> *I think if this industry is ever affected by any one major change it is the change in the capacity that is available to buy space on major market areas.*
>
> *I can think of a major headache and that is capacity which effects the relationships between people. It's the airlines that drive it themselves, of course. The more up lift capacity you put on in major market sectors, the more that puts the squeeze on your yield. It puts the squeeze on the relationships that you have with the agent (because forwarders can get better prices by looking around).*
>
> *(Mr. G., air carrier)*

...in the last couple of years capacity has been short on a world-wide basis.

(Mr. B., intermediary)

Freight capacity in the air freight industry has, until recent years, been at an over-capacity level. That may be changing due to reductions in capacity because of economic changes and an increase in airfreight traffic. However, world-wide over or under-capacity is not necessarily indicative of capacity on certain routes such as Europe/North America:

I think the one big question is space availability. We've had years of recession and carriers largely have cut back. Now that world markets are seeing an upturn in business there are definitely strains in supply capacity issues which weren't there a few years ago.

(Mr. W., intermediary)

The capacity that is available now across the Atlantic, particularly in the summer months, must be mind boggling to the airlines that have to sell their belly space.

We've perhaps improved matters in the last two or three years because demand has been very high for capacity, (from) everyone.

(Mr. S., air carrier)

Therefore, the carriers now have a lot of people by the balls and they are not going to have people go to them and say, 'I've got all this business. It could be yours but these are the rates I'm going to want and if you don't give me the rates I'm not going to

give it to you'. A lot of airlines will say, 'Bugger off, I don't want you'.

(Mr. B., intermediary)

When the supply of a product is far greater than the demand for it customers are usually able to obtain better prices and play off a larger number of suppliers. Conversely, when demand is greater than supply, prices often rise. With airfreight capacity, intermediaries realise that they are dependent on the air carriers:

(Intermediaries) are in the hands of the airlines for capacity and they can pull themselves down in comparison to the integrators. They're much more vulnerable than the integrators.

(Mr. S., air carrier)

Intermediaries also realise that capacity is cyclical and that there is the possibility that capacity may only be available to those customers with whom the airline has a good relationship:

(The intermediaries) are seeing it's in their interests to foster good relationships (with airlines) because otherwise they're going to have to find capacity from somebody else and they want to be with the guys who are going to survive.

(Mr. S., air carrier)

You have to manage the relationship and you have to remember the bad times and the good times. Where you think you have everybody by the balls when (the airlines) are struggling for cargo and they really are almost begging for it - when it goes the other way around the airlines don't forget.

(Mr. B., intermediary)

Maintaining good relationships in order to ensure capacity when demand outstrips supply implies loyalty:

> *I think the market is sufficiently competitive and there's enough capacity to take up that situation rapidly at the moment. If that were to change I think the loyalty factors may increasingly become significant.*
>
> *(Mr. W., intermediary)*

The potential for under-capacity encourages not only higher prices but a greater degree of commitment from the intermediary. Levels of utilisation of bookings would rise and voluntary commitments would become fixed and contractual.

> *Now if it ever became a situation where carriers dominate the market place and (we) go back to higher rate returns and more tied arrangements then we may well see a change in the commercial position.*
>
> *(Mr. W., intermediary)*

Therefore, capacity directly affects the level of commitment of the intermediary; under-capacity would increase this level. Under-capacity would raise the importance of freight with those airlines which don't take air cargo as seriously as the 'freighter' airlines. It also would also change the portfolio of intermediaries. The percentage of larger customers who have remained loyal and sufficiently utilised their PBs would increase compared to the percentage of those smaller, ad hoc intermediaries who would be shut out by the airline.

> *If you're dealing with a small forwarder who hasn't got clout (with) the airline, they're probably the ones more likely to get bumped off the flight than the big guys who've had a regular*

space booked with (the airline) of X,000 kilos every day of the week.

(Mr. S., shipper)

These factors all impact on the balance of conflict and collaboration between air carrier and intermediary. Freight over-capacity, higher levels of commitment by intermediaries, lower status of air cargo, and a customer portfolio biased towards larger and/or more contractual relationships may encourage airlines to move towards collaborating with intermediaries. Similarly, under-capacity, lower utilisation levels of advance bookings, higher importance given to air cargo, and customer portfolio in which the smaller, ad hoc intermediaries predominate may lead towards conflict between airlines and intermediaries.

THE BALANCE OF COLLABORATION AND CONFLICT BETWEEN AIRLINE AND INTERMEDIARY

	Collaboration	**Conflict**
Freight capacity	Over-capacity	Under-capacity
Status of freight	'by-product' of passenger transport	more serious 'freighter' airlines
Level of commitment to PBs	Higher utilisation, less voluntary/more fixed	Lower utilisation
Customer portfolio	biased towards larger and/or more contractual relationships	biased towards smaller and/or more ad hoc relationships

Table 8-1

It is important to realise that freight capacity in the industry, the importance of freight within the airline, and the level of commitment with intermediary-

customers all directly affect the balance of conflict and collaboration between air carriers and intermediaries. Freight capacity also affects each of the other two factors as well as the make-up of the portfolio of customer relationships. In addition, the level of commitment on the part of the intermediary affects and is affected by the mix of customer relationships while the status of freight with the carrier alters the portfolio also.

THE BALANCE OF THE 3 Cs BETWEEN AIRLINE AND FORWARDER

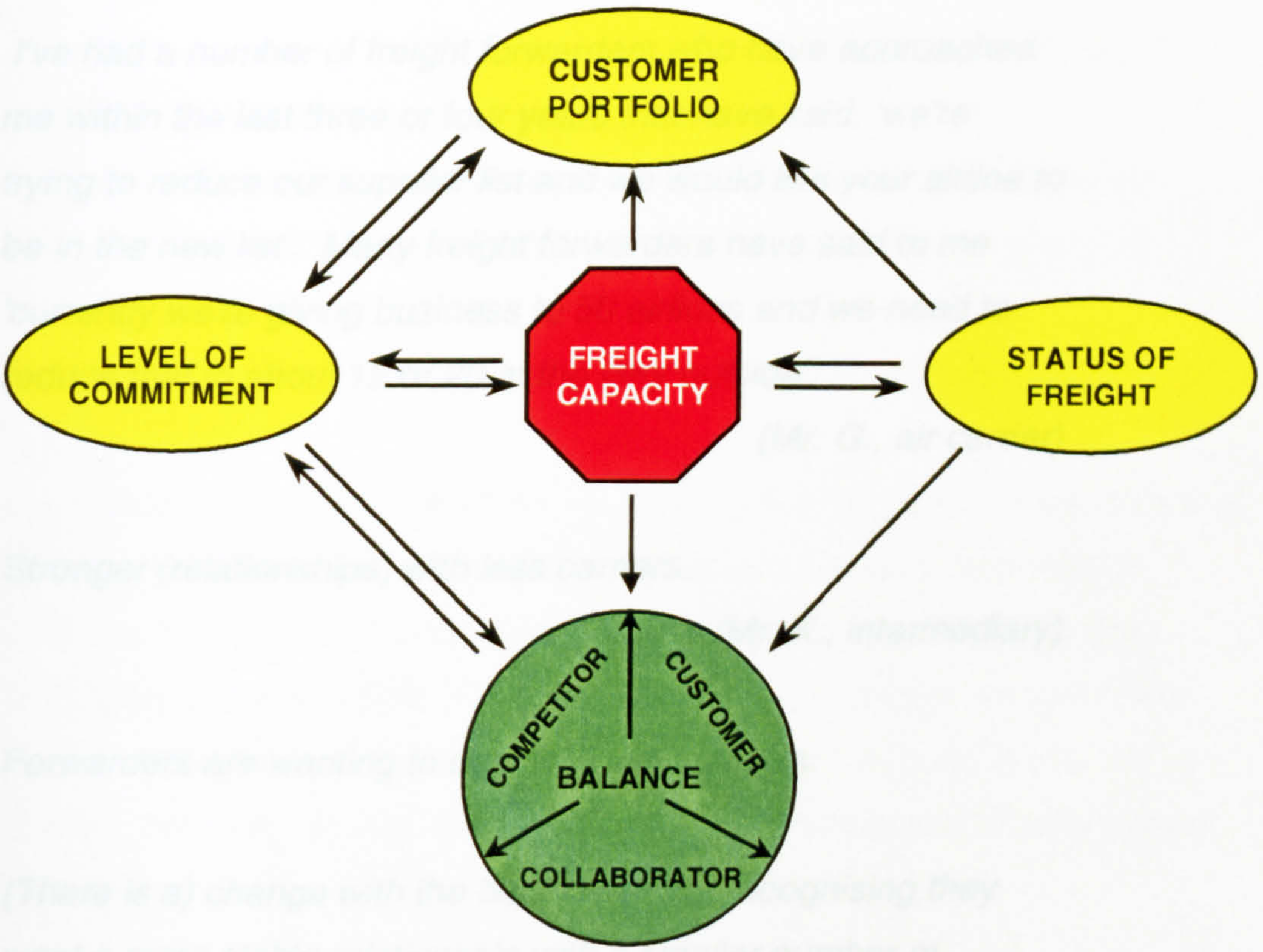


Figure 8-1

Route-specific capacity within the industry is the crucial element affecting buyer-seller relationships. If capacity increases airlines might become much more aggressive in approaching shippers directly; conflict would then develop.

8.2.2 Vendor reduction

Vendor reduction is a common theme in management literature as well as with carrier-buyer relationships (Krapfel, Salmond, & Spekman, 1991; Gibson, Sink, & Mundy, 1993; Mckinnon, 1994; Harland, 1996). The reduction in the number of air carriers with which an intermediary deals is related to the freight capacity available in the industry and the freight tendered to the individual airline by the intermediary:

> *I've had a number of freight forwarders who have approached me within the last three or four years that have said, 'we're trying to reduce our supplier list and we would like your airline to be in the new list'. Many freight forwarders have said to me 'currently we're giving business to 50 airlines and we need to reduce that to about 12 or 20 at the very outside'.*
>
> *(Mr. G., air carrier)*

Stronger (relationships) with less carriers.

(Mr. K., intermediary)

Forwarders are wanting to deal with less carriers.

(There is a) change with the big forwarders recognising they want a more stable relationship with a smaller number of airlines. The small forwarders haven't noticed anything, they just make a living.

There's going to be the big, strong multi-nationals who are going to (want) equal or fairly balanced partnerships with a smaller number of carriers. All the big guys are saying, 'we

don't want to deal with 100 carriers, we want to deal with ten or fifteen.'

(Mr. S., intermediary)

Because going into a country, you don't have an awful lot of choice about the number of airlines you can use. It's pretty much dictated by the services you want to use. I don't think there's been a major difference in the number of carriers we've used in that sense.

(Mr. T., intermediary)

The tendency to reduce the number of carriers or intermediaries with whom the intermediary or shipper deals has been going on for years

(Mr. J., intermediary)

Consolidation is one of the key services provided by freight forwarders and is the raison d'être of consolidators. By grouping goods from various shippers together the intermediary puts together a larger consignment which, because of weight break-point advantages, carries a much lower per kilo charge for each individual shipment than if shipped alone. Of course, this requires the intermediary send the consolidated consignment with one air carrier.

One can see that, with the development of consolidation over the last 30 years (before which) there was something called groupage in sea freight, the development from groupage has been into airfreight consolidation and with specialists who don't do anything else but consolidate. They consolidate on behalf of other forwarders or they are consolidators and forwarders. So they are then not acting as our agents but on behalf of

themselves and also on behalf of the shipper. So that's quite a significant change.

(Mr. S., air carrier)

Vendor reduction would result in the volume of freight tendered by each forwarder being shared amongst fewer air carriers. Thus the amount tendered to any one airline would be greater with a smaller carrier-base, the opportunity to consolidate would increase, and the power of the (now relatively speaking) larger intermediary would also increase:

Obviously the more (a major global intermediary) puts into one company like (a major airline), the more discount they get on the whole thing. Therefore, that pushes (this intermediary) in a certain direction.

(Mr. M., air carrier)

In order to get the buying power and a proper focus we really need to concentrate on who are the carriers that we want to support. If we look at the airline business we're going to say first of all who are the good quality network carriers and if you look at their network spread it is far superior to anyone else's. Then, I guess industry tends to look at the very good quality regional carriers. Why do I say regional carrier – because out of London it is one route, virtually.

(Mr. B., intermediary)

...most of the companies will not have the buying clout of a (major intermediary) because they are simply adding together more and more customers so (their) total buying clout is more than most individual companies.

(Mr. H., multi-modal carrier)

To the intermediary, dealing with less carriers means more buying clout and stronger relationships with the remaining carrier-base. However, using more carriers offers the intermediary greater flexibility, potentially better prices from a wider supplier market, and perhaps the opportunity to provide a greater and better choice of carriers to his shipper-customer:

> *(Intermediaries) have got to maintain that threat (of maintaining a variety of carrier choices) because it's in their interests to do so and they've then got choices of playing off one carrier against another. That is a fundamental conflict of interest.*
>
> *(Mr. S., air carrier)*

In their role as knowledge sources intermediaries provide that distillation of carrier choice:

> *I think not being able to vary, not being able to see the breadth (of carrier choice), not being able to get a choice. (These) are disadvantages (of dealing with carriers directly).*
>
> *(Mr. S., shipper)*

> *We should be able to provide them with a whole range of services be it courier, road transport, shipping or air. And a choice of solution within those categories.*
>
> *(Mr. B., intermediary)*

Even with the perceived benefits of reducing suppliers the decision on a supplier-base for many intermediaries is dictated by available freight capacity:

> *Two or three major forwarders are trying to concentrate on half a dozen carriers and reduce the number of contractors they deal with. But by and large it's space and price that dictate the*

market and therefore people now keep a wide portfolio of carriers in play.

(Mr. W., intermediary)

Can intermediaries maintain (collaborative) alliances with a large base of air carriers?

(Forwarders) would love to start talking about alliances but they recognise they can't have alliances with 15 or 20 carriers, they've got to play it one step removed from an alliance.

So they can't get closer in an alliance and are starting to position themselves very nicely (with) 15 or 20 carriers - they can always go to some more. So they can still negotiate heavily with the carrier while building a partnership, and cutting down the level of vulnerability in comparison to the integrated operator. And I think that's where the industry generally is.

(Mr. S., air carrier)

As Mr. S. mentioned earlier, playing off one carrier against another to obtain better rates is not conducive to closer relationships *('That is a fundamental conflict of interest').* Rate negotiations on a frequent periodic basis may not allow a strong partnership. Because of the effort and commitment required, long-term, close alliances may only be possible between a few participants. On the one hand, intermediaries are attempting to reduce their vulnerability to potential airline under-capacity by building closer relationships with strong carriers. On the other hand, they must keep their options open by having – and promoting to shipper-customers – the availability of a variety of carriers from which to choose. Playing off air carriers against one another is not reassuring to the alliance party.

While air carriers may hope for collaborative alliances with freight forwarders they may, at best, only be able to build ineffectual partnerships. And then only with the larger intermediaries who can balance their own capability to justify volume with each carrier/partner with the ability to maintain enough partnerships to be flexible and appease customer perceptions of variety of choice.

> *However, if, in a given market, (a major intermediary) deals with all the major players and all the major streams then they have some quite significant power. And as the numbers move and change and the market changes and the capacities change, then I do think it forces a move in one or another direction, which is either more carriers or less carriers.*
>
> *(Mr. M., air carrier)*

> *And I do think the scale of a company also has quite an impact. (A major intermediary) for example, in many ways, are so large that they're a huge customer for us already but they're also a big player in all the other carriers as well. I do see this polarisation of size and I think there will be a lot more (intermediaries like them).*
>
> *(Mr. S., air carrier)*

The matrix on the following page summarises this premise.

BALANCING VOLUME OF FREIGHT TENDERED TO CARRIER WITH NUMBER OF CARRIER ALLIANCES MAINTAINED

	Small number of alliances	Large number of alliances
High volume per carrier	Medium intermediaries	Large intermediaries
Low volume per carrier	Small intermediaries	Medium intermediaries

Table 8-2

While small intermediaries may be resigned to tendering a low volume of freight to a small number of carriers or to consolidators, medium-sized intermediaries can either allocate a small amount to a large number of carriers or a large amount to a select few. This is assuming that these alliances are of a similar type. If the intermediary chooses to vary the degree of collaboration amongst the carriers he may be able to maintain a larger number of carrier relationships. Traditional freight forwarders appear to retain a large base of carriers and do so with ad hoc relationships. Current global intermediaries are reducing that vendor base which allows them to build stronger relationships with the carriers remaining.

The matrix on the following page summarises this concept.

BALANCING THE NUMBERS OF AIR CARRIERS USED BY THE INTERMEDIARY WITH THE DEGREE OF COLLABORATION INVOLVED

CARRIER BASE	Low	High
Large	Traditional Intermediary	Major global neo-intermediaries
Small	Small intermediary	Neo-intermediaries

DEGREE OF COLLABORATION

Table 8-3

As mentioned, this is not necessarily an either-or scenario. The intermediary could maintain a mix of relationships; some based on strong alliances with carriers while others would be ad hoc or short-term. Peck et al describe such relationships as vertical (supplier) and horizontal (alliance) partnerships (Peck, Payne, Christopher, & Clark, 1998 (proposed)). Lambert et al suggest that equal alliances with all suppliers are impossible and not warranted; a mixture of relationships is achievable and more appropriate (Lambert, Emmelhainz, & Gardner, 1996).

The shipper-customer would like to see collaborative alliances between air carriers and freight forwarders however forwarders wouldn't feel comfortable putting all their eggs in one basket. Airlines would be happy to have such alliances with the *major* forwarders but would not want to lose the high yield obtainable from smaller, ad hoc forwarders.

8.3 The ocean carrier

As an asset provider the shipping line *"is the M25 of the high seas" (Mr. J., ocean carrier).* As with airfreight the intermediary tries to reinforce this role by supplying the functions of sales and value-added services. Again, there is a trend toward 'disintermediating' the intermediary. However, there is really no integrator in ocean freight that threatens both the carrier and the forwarder. The TPL (third party logistics) firms created by many of the shipping lines often depend on their parent companies' assets to transport goods.

> *The (ocean) carriers are setting up flexible divisions called "logistics divisions". They dare not call them freight forwarding divisions because that is what they are.*
>
> *Then when you look at the ocean carriers I think the (they) are talking about (dealing directly with shippers) but are not doing much about because they're hoisted by their own petard (because) of the political infighting (amongst) all of them in terms of ownership of the account (which) is actually destroying them. They'll have to lose the business before they get it back again.*
>
> *(Mr. J., intermediary*

Examining the position of the ocean carrier or shipping line using the factors that impact the air carrier shows major differences. For example, the majority of ocean freight is carried on non-passenger ships which means that the status of freight with cargo shipping lines is not second to passengers; their focus is exclusively on freight.

The mix of customers with an ocean carrier has a much higher proportion of shippers. Because containers eliminate or reduce much of the

complexities of handling, delivery, and documentation shippers who can fill them have no need for intermediaries. Most large shippers would deal directly with the carrier:

> *Moving FCL is very simple because you have only got to move the empty container to the shipper's premises. The shipper will load it, away you go and bang. And the documentation is not terribly complicated. The shipper might deal himself with the ocean shipping company's own forwarding department or he might get a freight forwarder to do it for him. Moving full containers is such a simple (task).*
>
> *Particularly when they get full loads because you don't really need a freight agent with full container load cargo.*
>
> *Basically, if you have 100 TEUs (twenty-foot equivalent units) a year for a particular destination and the shipping company positions the container - you don't need a freight forwarder for that. A freight forwarder actually complicates the issue.*
>
> *(Mr. B., intermediary)*
>
> *I think what happened in the past was that you had a shipping line and you had, in terms of a front man, the freight forwarder and then you had the shipper. And the freight forwarder acted as the medium between the shipping line and the shipper, whereas today I don't think there is much need for the freight forwarder in terms of full load capabilities. In terms of full load capabilities the freight forwarder really is not in the same position as he used to be because we can offer that same service package from a door to door basis.*

Well I would say the (ocean) carrier can do all the functions of a freight forwarder, but the freight forwarder can't do all the functions of a carrier.

(Mr. H., ocean carrier)

We prefer to work with shippers if we can.

It's usually the large shippers that deal with the carriers. They usually have their own export department or shipping department; if not, they are forced sometimes to use freight forwarders.

(Mr. W., ocean carrier)

To the shipping line, intermediaries and shippers are similar customers.

We offer (a service) to both the shippers and freight forwarders, there is no distinction between the two in that respect.

(Mr. W., ocean carrier)

However, ocean carriers' relationships with shippers are longer-term than with freight forwarders.

Freight forwarders try to play one (carrier off) against the other, so they are changing (shipping lines) quicker than a shipper would.

(Mr. W., ocean carrier)

Shippers often speak of their relationships with ocean carriers as they do with airfreight intermediaries:

We're now looking at (the relationships with the shipping line) as a partnership rather than just cost driven negotiation - still on a transactional basis, (however).

I think, in fact, we work pretty well together, so we don't have major issues with the suppliers of the shipping service.

(Mr. B., shipper)

So what we're looking at on this particular run is a partnering arrangement, whereby we share risk, we share profit, so we will expect to see a reduction if the same volume goes down.

(Mr. S., shipper)

Shipping departments within large exporters even consider themselves as freight forwarders in that they bring together many smaller shipments from all over their company and put together an entire container:

...we act as a freight forwarder in a sense (because we consolidate for many parts of our organisation) as a shipper.

(Mr. S., shipper)

...this guy saw himself as an in-house provider for twenty companies within the (large multi-national) group. And he built himself up into a nice little empire

(Mr. B., intermediary)

Benetton, the international clothing manufacturer and retailer, set up their own in-house forwarder, Benlog, which serves only Benetton and their associated suppliers (Damas, 1994). By so doing, Benetton can usually ship FCL (Full Container Load) to get the best rates.

The volume intermediary in ocean freight, as with his air freight counterpart, gets better rates:

> *The larger the freight forwarder gets the less revenue (the shipping line) gets, that's undoubtedly the situation, because the more volume the freight forwarder has to wave in front of the eyes of a shipping line, the better rates he will undoubtedly receive.*
>
> *(Mr. H., ocean carrier)*

> *(The ocean carriers have) given a three way split in this where they've said they are looking at categories (in which) category 1 says you've got 7,000 units or whatever, category 2 says 500 units. So what they've done is put these forwarders into these categories...*
>
> *(Mr. C., shipper)*

As collaborators, shipping lines would find it difficult to work with intermediaries. Both parties maintain strong sales forces targeting the shipper-customer:

> *There is a growing tendency in our industry to enter into service contracts with freight forwarders and that's usually done at very competitive rates. If you then have a sales organisation in Europe and North America it becomes almost obsolete because the freight forwarder is then*
> *going to take over from you. So we are very reluctant to enter those kind of arrangements with freight forwarders.*
>
> *(Mr. W., ocean carrier)*

As with airfreight, cargo capacity with ocean carriers is not scarce:

It's because of the increase in capacity that the global carriers have (provided). I believe that's an important factor, because they get global contracts. They are very much looking at their price. I think that's the biggest factor. Global carriers, because of their low price(s), are offering very competitive rates to freight forwarders because they have to fill the slots in order to get the benefits of the lower slot price. I think that's very important.

(Mr. W., ocean carrier)

Another similarity with airfreight involves vendor reduction. Even with the over-capacity available in ocean freight, intermediaries are reducing the numbers of shipping lines with whom they deal:

Yes I think (there will be a reduction in the numbers of carriers that an intermediary might use). I think the options will become more limited.

(Mr. N., ocean carrier)

The intermediary doesn't want the carrier to poach his customer. There is a tendency towards the intermediary dealing with less carriers.

(Mr. J., ocean carrier)

8.3.1 FCL/LCL dichotomy

The balance of conflict and collaboration between ocean carriers and intermediaries pivots on the carriers' ability to handle cargo filling less than a container. With the growth in containerisation shipping lines could provide a door-to-door service *with full containers.* Some writers define 'pure' forwarders as those concentrating on consolidating or grouping shipments to travel via sea whereas 'diversified' forwarders provide other services or have a strong interest in air transport (Murphy, Daley, &

Dalenberg, 1992). Groupage, a term used in sea freight similar to consolidation in air, is a major service offered by intermediaries with an interest in ocean freight (Coyle, Bardi, & Langley, 1996; Murphy, Daley, & Dalenberg, 1993; Murphy & Daley, 1995). In the 1960s containerisation began to make ocean transport more accessible to smaller exporters (Branch, 1985: p. 390). The intention of groupage is to combine LCL (Less than Container Load) shipments into FCL (Full Container Load) shipments.

Because most ocean transport is via container (Branch, 1994) the dichotomy between LCL and FCL shipments can be seen in the forwarder as customer or competitor. As a consolidator of LCL shipments the freight forwarder provides a service to the FCL shipping line. However, those shippers who use FCL can deal directly with the shipping line – those traditional value-added services that forwarders offer are irrelevant to most FCL shippers.

> *Moving full containers is such a simple (task) – it is the ability of the shipping company to actually load groupage containers or LCL traffic. Some are good at it, some are not.*
>
> *In the case of major shipping lines (handling door to door traffic) – Yes, full containers; and LCL groupage traffic – yes, possibly.*
>
> *(Mr. B., intermediary)*

8.3.2 Third party logistics services

In addition, many carriers now offer LCL services making them, in effect, an ocean integrator:

> *People like (a major shipping line), for example, have mastered (LCL traffic). They have got their own forwarding department.*

They are quite capable of doing it. And I'm pretty certain they would love to see the freight forwarder out of the arrangement because then they could control their own destiny.

(Mr. B., intermediary)

Now we used (a large shipping line) as a deep sea operator. (They) had a fine range of equipment, good ships, good itineraries and they took groupage and they took LCLs and FCLs. Fine, we can use them a lot like a carrier. We used them for clearing incoming goods because they had a clearance operation. They don't advertise so much as a forwarder because they would compete head on with the forwarders...

(Mr. S., shipper)

We are expected to schedule the vessels, to operate a weekly service, to have a fixed day of the week sailing, etc, and to provide containers and those kind of things. I think in some respects that is perhaps the old-fashioned approach, I mean today we need to be also (entering) the realms of the freight forwarder. Then there are some lines that do LCL but we don't as a shipping line.

(Mr. H., ocean carrier)

Some shipping lines openly go out and solicit business direct and operate their own LCL service around consolidation services.

(Mr. B., intermediary)

However if part of one container needs to be stripped and part of that container needs to be air freighted and then the rest of it goes LCL and the other containers go FCL, that becomes something which a forwarder is able to react to more quickly.

(Mr. C., shipper)

As well as competing for LCL traffic with the shipping line, the intermediary also competes as a knowledge source, providing alternative carrier choices and modes to the shipper:

> *Now a freight forwarder can give (the shipper) the choice and say, "You know, you can use this line and that will take a month to get there and this (other) line will take a week to get there and depending upon what you want, the rate scale will be like this". So I mean from their perspective (shippers) perhaps have more choice dealing through a freight forwarder given that they get a range of different options, whereas perhaps (a shipping) line can only give them one option.*
>
> *(Mr. H., ocean carrier)*

The intermediary is only a customer to the shipping line as a consolidator of LCL freight. The intermediary is a competitor for FCL freight and to those shipping lines involved in LCL cargo.

The balance between collaboration and conflict in ocean freight is not as finely poised as in air. The dichotomy between LCL and FCL cargo plus the continuing push by carriers' in-house 'forwarding' operations has resulted in a greater sense of distrust between the parties. This is compounded by the lack of a mutual integrator competitor:

> *I think there's a whole range of mutual suspicion between all three (participants) to be honest. I think that the strength of the relationships can maybe build up over a period of time, based on mutual trust. But I think it starts out as mutual suspicion. And a lack of willingness to probably hand over control.*
>
> *(Mr. N., ocean carrier)*

Therefore, a model of the relationship between ocean carrier and freight forwarder is simpler than that between airline and freight forwarder. The factors that affect the relationship between ocean carrier and freight forwarder are the extent of LCL freight services offered by the carrier and the prominence of logistics services provided either in-house or through a 3PL related company. Those carriers for which LCL is insignificant or which don't provide 3PL services would consider the freight forwarder as a customer. However, if the ocean carrier does offer LCL or 3PL services than it might consider the forwarder as a potential competitor.

LCL AND 3PL SERVICES AFFECT THE CUSTOMER/COMPETITOR DICHOTOMY

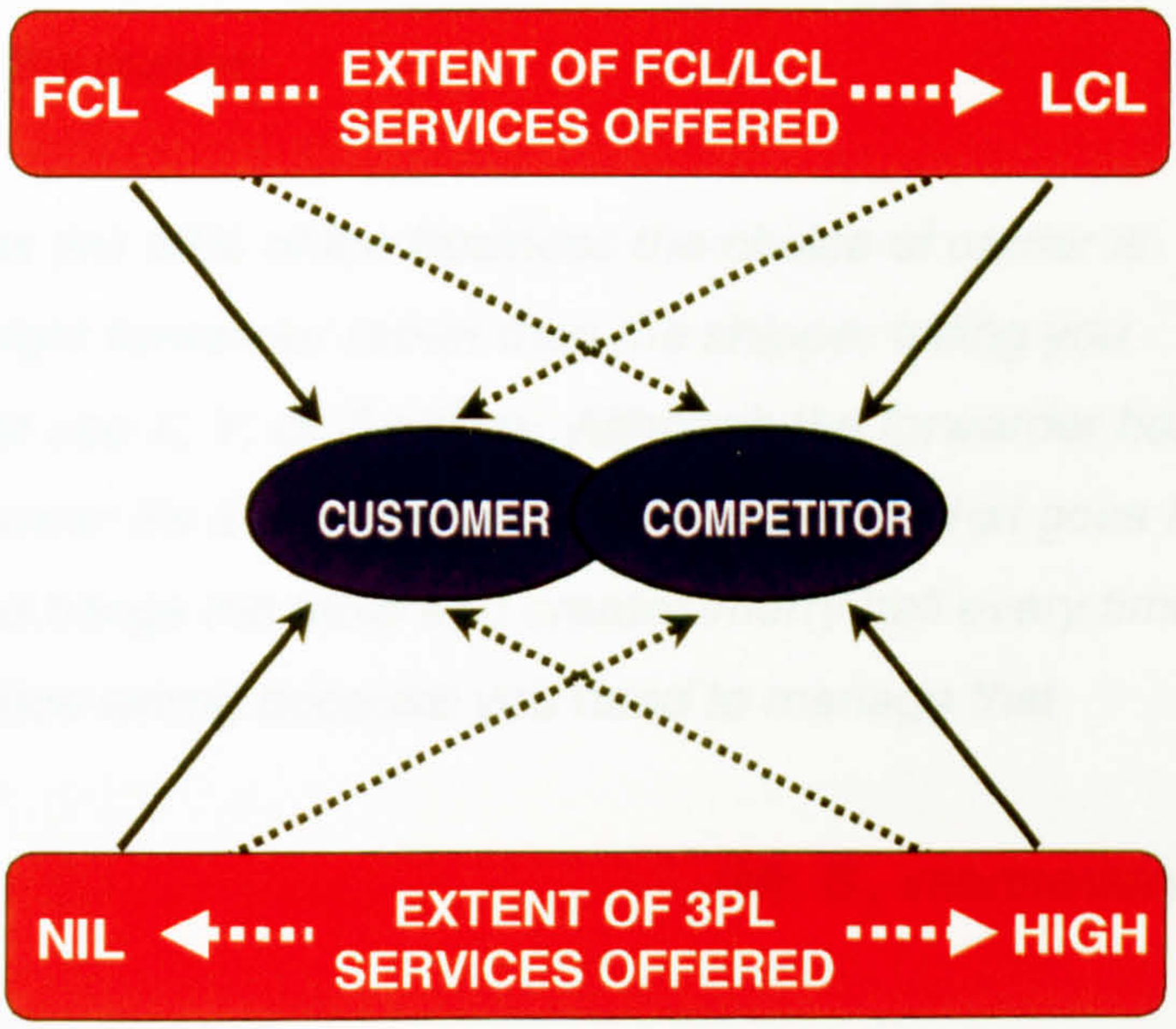


Figure 8-2

8.4 Power and influence

Power, as defined by Emerson (1962, p32) as 'a property of the social relation; it is not an attribute of the actor'. To hold power one must have

influence over another. Power in the distribution channel involving intermediaries has been a common theme in many articles (Wilkinson, 1996; Gassenheimer, Sterling, & Robicheaux, 1996; Gaski, 1996). The respondents often equated power over the other parties in the distribution channel as control over the movement of freight. Mr. N., an ocean carrier put it succinctly by suggesting that relationships between the parties build up from a base of mutual suspicion and a desire to retain control:

> *But I think (relationships) start out as mutual suspicion. And a lack of willingness to probably hand over control.*
>
> *(Mr. N., ocean carrier)*

Power over the other members of the triad or control of the distribution channel was a recurring theme whether it was the buying power of the intermediary over the carrier:

> *I would guess (in) 90% of the business the choice of carrier is left to the freight forwarder rather than the shipper telling you that you must use X, Y, or Z airline. Although the forwarder has the buying power it's a very foolish freight forwarder that goes to an airline and bangs the table and creates merry hell every time something goes wrong because you need to manage that relationship.*
>
> *(Mr. B., intermediary)*

or power in the intermediary-shipper relationship:

> *What it is all about is to get the customer by the balls. To get as much ownership, to do as much for that customer, to make sure he is locked into you, so that, in fact, he can't go anywhere else.*
>
> *(Mr. J., intermediary)*

Control over the distribution channel and power over the other parties were divided by transport mode.

> *But it isn't nearly a controlled relationship (in ocean) as it is in air. There is this rivalry and this mistrust generally between freight forwarders and shipping companies.*
>
> *(Mr. B., intermediary)*

> *On the air side most certainly the forwarder provides the bulk of his revenue with his freight offerings, that's why he's got so much power. On the surface transport side, probably his power is less than the air agent because he's there consolidating. They probably will gradually build up greater influence but right now they don't have quite the clout as the air but it's there.*
>
> *(Mr. W., shipper)*

When speaking of airfreight, air carriers indicated the need for the airlines to achieve more control over distribution while recognising that some intermediaries are softening their power imbalance by collaborating with them:

> *There's no doubt that KLM and other carriers believe they need to have more control over the distribution chain and want to go direct to the manufacturer or consumer.*

> *To me, the most important thing that is changing is the big (intermediaries) who control most of the business are becoming longer term in their thinking and less predatory. Because of fear of the integrator.*
>
> *(Mr. S., air carrier)*

At the same time some carriers appreciated the difficulty of gaining control at the expense of their biggest customers:

> *The trick is how the airlines can actually take back (their) birthright, take the power and be successful (without) alienating this group (forwarders) if this were to happen.*
>
> *(Mr. M., air carrier)*

With LCL freight, some carriers suggest that whoever controls the freight controls the relationship. The balance of power may hang not only between the exporter and the intermediary but must include the consignee of the shipment as well.

> *The emerging relationship (in ocean freight) is strongest between whoever controls the cargo - shipper or his customer (i.e., in terms of sale) and the intermediary.*
>
> *(Mr. J., ocean carrier)*

Freight shipped on a DDP (Delivery duty paid) basis may be controlled by the shipper or intermediary whereas freight shipped on an EXW (Ex works) basis would require the buyer to be responsible for many of the functions and related costs involved (Incoterms 1990 - Branch, 1994).

Many respondents believed that control of the information channel would give them control of the distribution channel:

> *Someone, somewhere has got to control that information (about the shipment). That's what the shipper needs, he needs to know all sorts of information and currently most carriers will not even supply it.*

You need the information to know that this flow is taking place and where the hiccups are and where, in fact, you can add value – you'd like that information. I think (if) information (is) the power we say it is – how many people can provide it?

(Mr. H., multi-modal carrier)

The airlines gather up all the information from forwarders, like a bank settlement plan, and the forwarders have got to pay otherwise they're out of business. So that has sharpened things up and (raised) control significantly for airlines. As a by-product, the market place information that is generated also enables airlines to know exactly what the market place is, what size, what the average yields are...

(Mr. S., air carrier)

The challenge for us – it's not a problem because I think we've got the right kind of information system – is that we've got to keep control of the physical movement of that freight to a time defined delivery when it is not physically in our control.

(Mr. T., intermediary)

One thing which freight forwarders have started to do with the larger manufacturers is put somebody into their industry to act as a go-between between the industry and the freight forwarder. This is very powerful, it's something that the shipping line cannot do because of cost factors. Perhaps the area that we look at as being the future is EDI and, in a similar way, that's putting the shipping line guy into the office except that it's in the format of a computer.

(Mr. H., ocean carrier)

The pairing of power and trust may appear to be an oxymoron. And yet these factors are often entwined within relationships (Leahy, Murphy, & Poist, 1995) though usually on a personal, rather than corporate level (Thorelli, 1986). Trust can be considered as a method of reducing control (Smith & Barclay, 1997) or as a mechanism of organisational control (Dyer & Chu, 1996) as it reduces transactional costs due to administration expenses involved with curbing opportunistic behaviour (Zucker, 1986). Opportunism, a descriptor of some intermediary relationships, has been described as the opposite of trust (Dyer & Chu, 1996).

The respondents occasionally spoke of trust or commitment in the context of power and control:

> *Basically I think it's a control issue. I think (shippers) also feel that any intermediary is often going to add cost rather than value. That's why I said earlier about the sort of mutual mistrust which you have to overcome.*

> *...it's building up the confidence and the trust. I think that to begin with, it's a bit like a marriage or an early relationship where you've got to get used to one another and adapt accordingly before you actually get to the point of having a mutual basis for doing business together. And I think that during that intervening period, the majority of companies would be uneasy relinquishing too much control. Certainly if they have preferences where carriers are concerned. Now over a period of time if the intermediaries do what they do, if they can build their confidence and trust then they can start to influence those freight or carrier decisions.*
>
> *(Mr. N., ocean carrier)*

The lack of trust in the context of control with the relationships between intermediary and carrier were a recurring theme:

> *But it isn't nearly a controlled relationship (in ocean) as it is in air. There is this rivalry and this mistrust generally between freight forwarders and shipping companies.*
>
> *(Mr. B., intermediary)*

Some shippers indicated a relatively high degree of trust in their freight forwarders:

> *And there's a lot of trust there. I mean I would put an enormous amount of trust in (the forwarders') knowledge and experiences that they've had with their chosen carrier because they have the direct contact which I don't have. So I have to rely on their ability in dealing with them.*

> *I'm not interested normally (in salesmen from off the street) because to get the best out of the chosen four (forwarders with which we deal) there has to be an element of trust that you build up between the two and I think to continually threaten to pull the rope from beneath the feet of the guy who is currently handling the business doesn't do the business relationship any good. So, having said that, I think if we'd have had this conversation two years ago I might have given you a very different answer.*
>
> *(Mr. S., shipper)*

However, some intermediaries thought differently about the shipper/intermediary dyad:

> *Because they don't necessarily trust the middle man. It is always difficult to be a middleman. A middleman, by definition,*

is really "taking a margin from both sides" so he has really got to be adding value.

(Mr. J., intermediary)

Power imbalances exist within the distribution channel and are affected by transport mode. As used earlier, centrality is one indicator of the balance of power. While many carriers want to take control of the distribution channel, some intermediaries have considered relinquishing this control to the final customer – exporter or importer. It appears control of the information medium may be a way to divest oneself of physical control while still retaining some degree of power. Trust varies across transport modes and between shipper/intermediary and carrier/intermediary dyads.

8.5 The commercial relationship as an exchange process

Respondents spoke of the commercial relationship between themselves in terms of length and strength, formality, flexibility, power and control, honesty and loyalty, and responsibility and risk. Some areas (length, strength, formality) apply to the exchange process while others describe the relational context in which the interaction takes place.

The effects that interorganisational information systems (IOSs) will have on those facets of the commercial relationship outside of the exchange process are not as relevant in this phase of the research as the effects that IOSs will have on the buy-sell interaction. The contextual view that my respondents take of the *present* relationships is of importance to the potential future effect of a possible IOS.

The parameters under which the exchange process may be described and, indeed, quantified are:

1. *duration* (life of commercial interaction)

2. *level of continuity* (discrete, unrelated transactions versus a formal or informal relationship contracted over a period of time). Often defined as *expectation of continuity* (of future interactions: low expectations would imply discrete transactions while high expectations would suggest relational) (Noordewier, John, & Nevin, 1990; Ganesan, 1994) or *durability,* as a measure of consistency or endurance in which durable relationships are constantly in interaction and transient relationships exist for only a few transactions (Barnes, 1974; Sriram & Mummalaneni, 1990; Scott, 1991).
3. *frequency of commercial interaction* (transactions over period of time)
4. *intensity* (relative value of the relationship).

This list is not all inclusive as further research may indicate additional factors are also important.

The respondents spoke of the duration of a relationship in terms of the length of time over which business had been sustained. Formally contracted arrangements were not common in either air or ocean freight though, as has been mentioned, they were increasing in number or being considered. Therefore, most commercial interaction would be transactional or ad hoc in nature. However, many shippers had remained loyal to their intermediary and shipper-suppliers. Intermediaries, while keeping a relatively large base of carriers, had an 'inner circle' of preferred carriers with whom they maintained stronger relationships - even if only to give them the option to quote first.

The duration of the relationship between intermediaries and shippers varies from very short-term to ones spanning decades:

> *But the vast majority (of relationships with shippers) is not by any fixed agreement whatsoever. It is basically a relationship*

that you strike up with somebody by persistence in selling. There is still a good degree of loyalty for a big big percentage of shippers. They have dealt with their agent over a number of years.

(Mr. B., intermediary)

I've known large companies with very loose ended contractual (relationships) or no contract per se, in fact contracts in our industry are, as you're probably aware, very few and far between. So the relationships are really revolve around our professional shippers and our professional forwarders and that's less dependent I think on size.

(Mr. W., intermediary)

However, the duration of the relationship with carriers (as opposed to the continuity of these relationships) was not discussed directly. It appears that, while the interaction between intermediary and carrier may be transactional or contracted over a period of up to one year, most intermediaries have been dealing with those carriers for many years. The expectation of continuity of the relationship between intermediaries and shippers depends on the relationship being formally contracted or not:

Typically, when looking at our industry, the relationship between us, as the intermediary, and the shipper is a long-term one based on 5 year contracts, 10 year contracts, and based on defined service levels where service is more important than cost because the relationship is based on "customer intimacy".

(5 to 10 years) is a very long term. As soon as you talk about asset take-over or people transfer you talk about long-term

contracts because it is the only way you can justify those investments.

(Mr. H., intermediary)

You can only supply logistics services under some kind of contract, some kind of long term partnership. You know that's not the sort of piece of business that just comes knocking on the door and you do it once and it's gone away. We still have an awful lot of business like that, and there's an argument for taking it because the whole infrastructure is there and you know it allows you to build up a certain amount of pivotal weight on consolidations.

(Mr. T., intermediary)

Three years ago in international logistics people were selling on a transaction basis and now they are selling more on a contractual basis. Yes, it is becoming a stronger, more contractual, because of the investment, because of the high cost of people - the shortage of people in this field who understand what is going on.

(Mr. J., intermediary)

The relationship between the shipper and the traditional forwarder, I think, is changing. The traditional relationship was that the shipper would jump ship for a penny a kilo because his sole function in life was to look for cheap. He would have nothing to do with looking for quality - the whole thing was driven by cost. There was no loyalty; if someone came along tomorrow and offered you a better rate, you'd go. That's part of the lack of sophistication of the whole industry; in my view it's still very much - when capacity is low, prices are high and when

capacity is high, prices are low and in between times everybody's ducking and diving for a penny a kilo.

It is coming down to the fact that people don't want to chop and change. They do recognise that you can get more out of a long term relationship in the end and that it isn't necessarily all about cost.

(Mr. G., intermediary)

The expectations of continuity of the interaction between intermediaries and carriers were polarising; some intermediaries with contractual, long-term arrangements with their shippers described their interaction with carrier-suppliers as transactional and ad hoc while others would suggest arrangements contracted up to one year in length:

If you look at the relationship between us and the carrier (it) is one very much based on short-term contracts, probably, once off or (over) months or a year. Typically based on price because we are looking for the lowest price obviously within a certain price range but we are looking for operational excellence within the right cost. That's a fair description: customer/intermediary are long-term; intermediary/carrier relationships are short-term.

I think these (relationships with carriers differ from those of a more traditional forwarder) because the forwarder wants to build his own virtual network and we are not necessarily looking for that because we are making those contracts based on dedicated contracts (with customers) that we have. So we do not try to build a virtual network with those carriers - we try to serve as one customer through a contract so - sounds a bit harsh - but we are not interested in a very long good

relationship with a carrier. We want a good price and a good service and that's it. That might change from day-to-day.

(Mr. H., intermediary)

We also have long term contracts (with carriers), I mean long term in our industry is a year.

(Mr. K., intermediary)

There may be voluntary commitments on space, tonnage and time by some of major consolidators to some of the major carriers but in the large I consider it very much an ad hoc market.

(Mr. W., intermediary)

Shippers saw the relationship with intermediaries as ongoing, subject to change if mistakes were made or better rates were obtained:

There's nothing saying that it starts and ends, it's ongoing, we have operational reviews on a by monthly basis...

(Mr. C., shipper)

In terms of forwarders, again we've good working relationships with the forwarders who are appointed by our customers. But as I've said before we don't really encourage customers to go in for nominating forwarders.

(Mr. I.B., shipper)

We don't have any contracts with our global intermediaries. We do tend to use them for at least 12 months rather than on a consignment by consignment basis.

We change (forwarders) on an ad hoc basis.

There's no contract but we don't change (forwarders) very often.

(Mr. S.B., shipper)

Expectations of continuity of the relationship between shippers and forwarders showed a rise in more formal, contractual relationships away from the transient, ad hoc interaction:

Yes I do (see the arrangement becoming more formal and contractual). I think we will be putting more emphasis on performance and I think that really, at the moment it is a good working relationship with a number of key performance indicators.

(Mr. C., shipper)

The contracts we have are normally two or three years.

(Mr. S., shipper)

They are fairly loose, but extremely important. I mean there's no formal contract signed. I would put together a formal tender document of all the business that I have control of and I would invite people to come in and sit and talk to me and say, 'this is the traffic that I have, this is the profile of the business that we move globally, would you like to quote for any or all of it?'. It's done on an irregular basis.

I fully intend to go out to tender every other year or something. I think now I'm moving away from that feeling more towards developing a longer term relationship with my chosen forwarders.

(Mr. S., shipper)

As I said, we use 8-10 (forwarders). What we used to do, being honest with you, with certain markets, we'd play the game. We would say, 'Right, I'm getting £1.20 per kilo off Joe can you give me £1.18 or £1.15'? Now we always ended up with people who would come in and offer you £1.05. Perhaps 10-15 years ago we'd have changed. Now we don't change for those reasons. We tend to create more long term relationships.

We have no formal contracts with any of (the forwarders). What we do have regularly is review sessions with them.

What it meant of course was that the people we used to have doing this ad hoc type of freighting - I'll ring Joe and see what he's offering and I'll ring Bill and see what he's offering - you didn't actually a) have the time to do it and b) your core business wouldn't allow you to do it, because everything became that much more urgent.

(Mr. L., shipper)

The shipper's relationship with his carrier, nominally the shipping line, brought up the change from conference agreements to transactional interaction:

Over time this contractual element has not totally disappeared but if you go back to the old conferences and you've signed an agreement - you couldn't break that. If you did or you wanted dispensation you had to go and ask - those days have gone. I think the evergreens that came along broke all that. So now we've good working relationships with suppliers of that service, we talk regularly, and we're trying to build partnerships so that we get into win win situations.

I think the biggest change is the relationship we have with the shipping line, that we're now looking at as a partnership rather than just cost driven negotiation. Still on a transactional basis, however.

(Mr. I.B., shipper)

Ocean carriers indicated that the duration of their relationships differed between those with shippers and those with forwarders. The relationships with shippers were over a long period while those with forwarders were short:

with intermediaries:

With freight forwarders its more difficult because they're far more short term and its more difficult to build up that kind of relationship with a freight forwarder.

(Mr. W., ocean carrier)

It's relatively short term (with) the freight forwarder... You can't really generalise but it will change from shipper to freight forwarder, but generally speaking I think that its short term.

(Mr. H., ocean carrier)

whereas with shippers:

It's not a contracted relationship, its a long term relationship, they like us and we like them, there is trust between the two parties and there you reach a kind of relationship that's very difficult to break.

(Mr. W., ocean carrier)

I think it's very much moving towards more long term transactional, in the sense that the arrangements and alliances that are being formed, are more strong. I think there is more commitment required and I think therefore, inevitably, that means that it's more long term.

(Mr. N., ocean carrier)

The relationship between the line and a shipper, once it's developed, can be much longer term, because the shipper can see the benefits of having a direct relationship with a line and not having the involvement of a freight forwarder who will move their traffic around many different lines. Therefore they won't know from one week (who they're using).

(Mr. H., ocean carrier)

I think air is probably more short term, maybe more flexible.

(Mr. N., ocean carrier)

As can be expected from the air respondents' answers, the airlines in Great Britain from which these respondents came, are all in the 'inner circle' of favoured airline-suppliers. While they may have dealt with forwarders on a transactional basis these relationships have been on-going for many years.

Expectations of continuity were similar across modes. Both air and ocean carriers considered their relationships with intermediaries to be transactional:

If an agent starts to feel he's being threatened by another agent, he will react to save himself, and if the course of action he's taking will break the relationship he has with the airline,

he'll do that. So it is not forever. ...in the end it's driven by one thing and one thing only, the bottom line, regardless.

(Mr. G., air carrier)

(Relationships with forwarders) are getting more difficult. I wouldn't say they were stronger, it's getting more difficult all the time, more short term. It only happens exceptionally by people who are prepared to sign long term contracts and if they do, they want very attractive conditions which are not always in the interests of the carrier.

(Mr. W., ocean carrier)

Those relationships between carrier and intermediary that were contractual were only in terms of one year or less. It is perhaps interesting that Mr. W. does not necessarily consider contractual relationships with forwarders as being desirable, perhaps indicating the portfolio of customers preferred by air and ocean carriers.

8.6 Summary

This chapter has looked at the position in which the carriers have found themselves. For airlines, route-specific freight capacity, the status of freight within the airline, the level of commitment of the forwarder-customer, and the make-up of the customer portfolio all affect the position of the airline vis à vis the intermediary. For shipping lines it is much simpler: the degree of LCL services offered by the carrier and the extent to which the carrier has entered the 3PL market are the major factors impacting on the carrier/intermediary relationship.

The dyad of intermediaries and shipping lines does not face as strong an integrated, third-party competitor as does the air freight industry. Without this integrator-competitor and with little history of walking away from one's

distribution 'birthright', collaborative alliances between carrier and intermediaries are not as common as with airfreight. The picture is more black and white than the grey of airfreight.

The intertwined concepts of power and control as well as trust and commitment were mentioned by all respondents. Within this triadic 'supply chain' it appeared that control was very important, at least for the carrier and intermediary. For these two, while trust of and commitment to the other was a desired commodity, it wasn't easily forthcoming. It was generally felt that intermediary-control of the information flow was sufficient to maintain the forwarder's central position.

The duration of the relationship and the expectations of continuity between buyer and seller varied between the two dyads. With the shipper-intermediary dyad the relationship may be longer and more durable whereas with the intermediary-carrier dyad it may be more transient. These measures may be changing with the trend towards dealing with fewer suppliers and building stronger relationships with those remaining. Transport mode did not play as important a factor here. Both airlines and shipping lines agreed that their relationships with freight forwarders were more transient and ad hoc then those with shippers.

In the shipper/intermediary dyad the increase in formal relationships would raise the expectations of continuity but possibly restrict the duration contractually unless renewed. In the intermediary/carrier dyad the transactional nature would appear to be continuing albeit with some major players investigating longer-term, more formal arrangements. These interactions are taking place within a context affected more by modal choice than by any other internal difference.

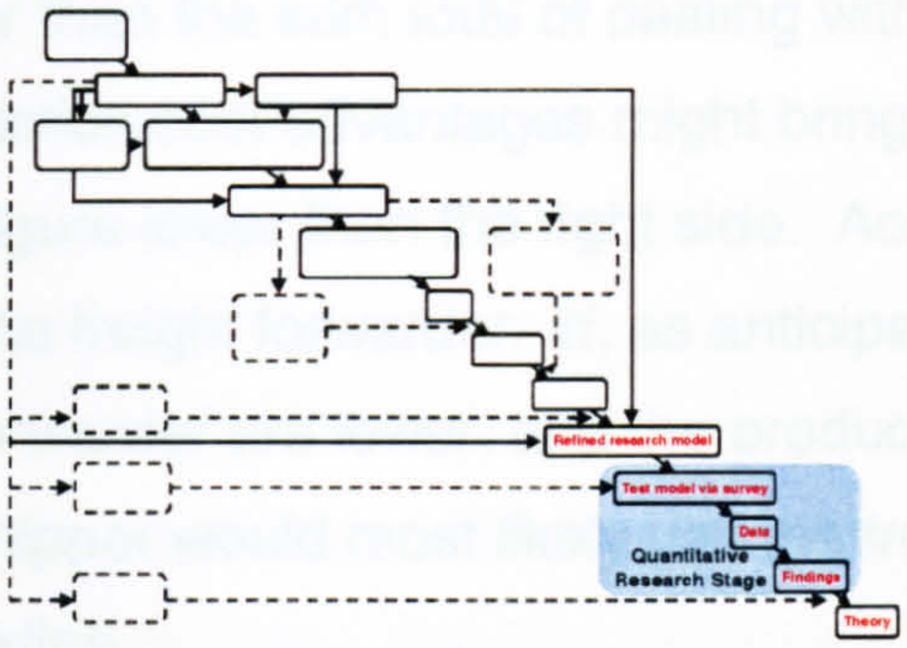
The previous four chapters comprised the first phase of the research. This qualitative phase involved examining respondents' views of the current

state of the commercial relationships between the intermediary, carrier, and shipper in global distribution. These commercial relationships consist of the exchange processes within a relational context.

The initial model of the relationships in the global logistics triad has split into two, differing by transport mode. The model made up of shipper, forwarder, and airline is more complex because of the inclusion of the integrator; the perceived roles and centrality of the intermediary; the historical evolution of the airline/forwarder relationship and the waxing and waning of the airline's influence; and, with most airlines, the pre-eminence of passenger traffic. The relationship between ocean carrier and forwarder sustains two roles – competitor and customer. However, that between airline and forwarder includes the role of collaborator. This more complete model coupled with industry interest and the resultant comparative ease of access became the focus of the second phase of the research.

These complexities may also explain why the airline has been almost excluded from the supply chain. Exporters realise, of course, that the airlines actually carry their shipments but they perceive the forwarder as the vendor of the transportation services they purchase. The end result is that the forwarder has become the intersect of two supply chains: that of physical trade between exporter and importer and that of transport services in conjunction with carriers and other providers. As a 'knot' in a net(work) of criss-crossing supply chains the freight forwarder is well placed to co-ordinate, link, and manage the product and service flows in the grey area beyond this intersect.

Chapter 9: QUANTITATIVE RESEARCH STAGE – THE REFINED RESEARCH MODEL



9.1 Introduction: From exploration to testing; from qualitative to quantitative

With a focus on the shipper/forwarder/airline triad the questions become *"How does the airfreight forwarder add value through cost reduction to the shipper?"* and *"What causes the shipper to use an airfreight forwarder (or airline) over other airfreight suppliers?"*. As discussed earlier in this dissertation, it is held that the intermediary offers some sort of administration or transaction cost reduction. This is usually in conjunction with some expected production cost advantage or advantages. In the case of forwarder preference on the part of shippers, the refined research model has become:

$$\sum_{i=1}^{k} T_{SF_i} - \sum_{i=1}^{m} (P_F - P_C)_i \leq \sum_{i=1}^{n} T'_{SC_i}$$

where the left side of the equation represents the sum of the transaction costs between the shipper and k forwarders ($\sum_{i=1}^{k} T_{SF_i}$) minus the sum of the m production cost advantages of the forwarder ($\sum_{i=1}^{m} (P_F - P_C)_i$. This total should be less than or equal to the sum of the transaction costs *avoided* between the shipper and n carriers ($\sum_{i=1}^{n} T'_{SC_i}$). In more simple terms, when a shipper uses a freight forwarder over an airline or airlines, he, consciously or unconsciously, balances the costs of transacting with that forwarder against the *total* perceived costs of transacting with a variety of airlines. This continual comparison of (potential or actual) transaction

costs is influenced by the expected production cost advantages held by the intermediary. Even if the costs of transacting with the forwarder were higher than the sum total of dealing with a number of airlines, the production cost advantages might bring the left side of the equation down to a figure lower than the right side. Accordingly, the shipper would still use the freight forwarder. If, as anticipated, the costs of transacting with the forwarder are lower, and the production cost advantages do exist, then the shipper would most likely use the freight forwarder to the exclusion of the airline.

9.2 Refined Model

In order to carry out quantitative testing of these questions, it becomes advantageous to refine the model to include additional factors that may affect the exchange relationships within the global airfreight triad. The realism perspective suggests that, were this refined model to correctly represent the relational structure and the driving mechanisms of the global airfreight triad, the phenomena of global freight intermediation would then be causally explained ((Harré, 1961; Keat & Urry, 1975; Blaikie, 1993). The model becomes a hypothetical description of these existing entities and the relationships amongst them. If tests of this model are successful, it would give good reason to believe in the existence of these relational structures and driving mechanisms. Developing a suitable instrument to confirm these claims will verify their existence. Repetition of the process of model-building will help explain these structures and mechanisms.

Therefore, while taking a realism perspective excludes actual hypotheses, it does support a hypothetical model which is subsequently tested. Hypotheses become further facets of the polished model. The basic transaction cost and production cost advantage components of the model have been discussed above. The interviews in the first qualitative phase plus the literature review discussed in Chapters 2 and 3 have brought to

light other factors that may affect the relationship amongst the freight forwarder, airline, and shipper.

Size is an important factor – not number of employees or revenue – but the 'exporting' size of a company. It may be expected that those companies who export many shipments would thus have more experience with shipping and with forwarders and airlines. Because they may transport comparatively more shipments they may be able to 'self-consolidate' and use the airline directly. Other size-related aspects would include the importance exporting has to a company, the number of consignees in any one trading region, and the number of carriers into any one region with which the shipper trades. Again, these latter two factors could indicate the ability of the shipper to self-consolidate into any one region.

One might expect shippers highly experienced with ocean freight to deal directly with the carrier. Accordingly, experience with ocean freight could be a moderating factor for airfreight shippers. Finally, the terms under which an exporter trades may be relevant. Those exporters who sell on a duty paid basis (i.e., DDU or DDP) appear to take more control of their downstream distribution. It may be more common for these shippers to deal directly with carriers – air or ocean. Those exporters who sell at the other extreme, notably ex-works, may wish to absolve themselves of the responsibility of shipping.

All or some of the above factors could be included in the refined model.

9.3 An introduction to Transaction Cost Theory

Transaction cost theory (TCT) has been discussed several times already in this dissertation (Chapters 3 and 4[1]). Chapter 10 will fully explain TCT and transaction cost analysis in the context of this research, most notably the

[1] see page 3-39 and pages 4-24 through 4-29

operational differences between the work of the architect of transaction costs (Coase, 1937) and its most prominent advocate (Williamson, 1975). These differences revolve around a direct versus indirect measure of transaction costs. Internalisation of the intermediating function as a market/hierarchy decision will be discussed as will the production cost advantages of the intermediary. Finally three often scrutinised aspects of TCT will be examined: normative use of the theory, respondents' perception of costs that may or may not have occurred, and the relative comparisons of actual and potential costs.

Chapter 11 will apply TCT to the research. Transaction cost analysis (TCA) will be based on an instrument derived from an experiment into TCT's framework (Pilling, Crosby, & Jackson, 1994). How this instrument was adapted to the intermediary, how production costs were handled, and what demographic factors (as outlined above) were obtained make up the initial part of the chapter. The independent and dependent variables and their initial transformation will be considered. Finally, the assumptions recognised and the population targeted will be examined.

Chapter 12 will cover the statistical analysis of the data while Chapter 13 will look at validity issues and rigour in the research.

Chapter 10: TRANSACTION COST THEORY AND APPLICATION

10.1 Introduction

Williamson once defined transaction cost economics as 'a comparative institutional approach to economic organisation, in which technology is de-emphasised in favour of organisation, and the economising action resides in the details of transactions and the mechanisms of governance' (Williamson, 1996, p:131). He suggests that the combined result of these three elements is a predictive theory of economic organisation in which a few transaction cost economising themes embrace a large number of dissimilar phenomena.

Research based on transaction cost theory has increasingly moved away from its roots in organising activities between markets and firms. In the 1980s and early 1990s the TCT approach to vertical integration looked at the firm's decision to backward integrate (into parts or material supply) or forward integrate (into sales and distribution). In logistics and supply chain research, such vertical integration research was typified by Maltz, who looked at the corporate decision to bring shipping in-house and to outsource the warehouse function (Maltz, 1993; Maltz, 1994); Anderson et al, who compared the independent sales force (manufacturer's representatives) with the integrated sales force (employed house accounts) (Anderson, 1985; Anderson & Weitz, 1986); Aertsen, who asked why firms contract out the physical distribution function (Aertsen, 1993); Monczka et al, who examined the relationships between suppliers and manufacturers (Monczka, Callahan, & Nichols, 1995); and Hobbs, who analysed the farmer/processor/supermarket triad in Scottish beef cattle sales (Hobbs, 1996). A sub-set of vertical integration has been entry into foreign markets. Klein et al studied the marketing channels employed by exporters (Klein, 1989; Klein, Frazier, & Roth, 1990; Klein & Roth, 1993).

Vertical integration research has looked at the 'extremes' of governance: in-house or complete integration and outsourcing. Because governance could be a continuum of relationships TCA practitioners have also looked at interorganisational relationships between these extremes (Noordewier, John, & Nevin,1990; Sriram, Krapfel, & Spekman, 1992; Stump & Heide, 1996).

In much of the empirical work involving TCA, researchers have advanced our knowledge of TCT, building on the accomplishments of Coase and Williamson.

10.2 Coase and transaction cost theory

Ronald Coase came up transaction cost economics as an explanation for the firm (Coase, 1937). His initial concept was that markets and firms are simply alternative governance structures which differ because of transaction costs. The 'costs of running the system' or transacting in a market may be greater than the costs of organising the transaction or exchange within a firm. Therefore, the proposition suggests that a firm will internalise those activities it can perform at a lower cost and will outsource to the market those activities where outside suppliers would have a production cost advantage. Coase argued that 'a firm will tend to expand until the costs of organising an extra transaction within the firm become equal to the costs of carrying out the same transaction by means of exchange on the open market or the costs of organising in another firm (Coase, 1937, p. 395).

While Coase called these costs 'marketing costs' it wasn't until thirty three years later that Arrow renamed them 'transaction costs' (Arrow, 1970). Coase separated these marketing or transaction costs into ex ante costs – those that occur *before* the exchange – and ex post costs – those that occur *after* the exchange. Nominally, ex ante costs would include tasks like

drafting contracts or negotiation while ex post costs would include monitoring and enforcing agreements.

Transaction costs are not the only costs involved in the 'make or buy' decision. It was presumed that firms went to the market in order to obtain a product or service because of the expected production cost advantages. Exchange in the market might cost more in terms of transaction costs than providing the same product or service in-house. However, only if these transaction costs exceeded the production cost advantages of the market would the firm resort to a hierarchical governance structure and bring that product or service in-house.

10.3 Williamson and transaction cost analysis

Williamson, probably the most widely known developer of TCT, categorised transactions as market transactions, which support co-ordination between multiple buyers and sellers and hierarchical transactions, which support co-ordination within the firm (Williamson, 1975). He also suggested that transaction costs included both the direct costs of managing a relationship and possible opportunity costs from making inferior governance decisions. Perhaps Williamson's most noted contribution came from his depiction of human behavioural assumptions and transaction dimensions.

The two principal behavioural assumptions were bounded rationality – the assumption that managers are constrained in their cognitive ability and limited in their rationality – and opportunism – the assumption that, given the opportunity, managers may act dishonestly. In uncertain environments (explained below) managers may be restricted by their informative and communicative ability. The term 'bounded rationality' came from Simon who suggested that economic actors are not exceptionally rational. In fact, they are limited in their ability to formulate and solve complex problems and to process information (Simon, 1957; Williamson, 1981). With opportunism,

it is difficult for anyone to know a priori who is trustworthy and who is not (Chiles & McMackin, 1996; Moschandreas, 1997). Therefore, opportunism as a driver of transaction costs can exist with any exchange relationship.

These two behavioural assumptions come into play when matched against two dimensions of the transaction: uncertainty and asset specificity. Environmental uncertainty exists when one is unable to identify the circumstances surrounding an exchange in advance. Because of the assumption of bounded rationality, this inability to predict future events raises communication, negotiation, and co-ordination costs ex ante (direct costs) as well as leads to maladaptation (failure to adapt) costs (opportunity costs) (Jones, Hesterly, & Borgatti, 1997). Similarly, behavioural uncertainty comes from the difficulty with monitoring ex post the performance of the supplier. Problems arising from behavioural uncertainty lead to increased selection costs ex ante and measurement costs ex post (direct costs). Therefore, under TCT, high levels of uncertainty would be reflected in greater transaction costs.

Asset specificity is a factor in transaction costs because of a perceived opportunistic threat that may involve an asset or assets specific to the transaction. These assets might include physical assets such as warehouses, human assets such as knowledge, and site assets such as locating manufacturing facilities alongside the firm. Those assets with high asset specificity have little value outside of the transaction. It would become difficult to replace exchange partners because of the high level of switching costs. Costs would arise both ex ante from creating contractual safeguards (direct costs) and ex post from failing to invest in productive assets (opportunity costs).

In addition to the two main assumptions of human behaviour and two dimensions of transactions, Williamson provided a third behavioural assumption and another transaction dimension. As a construct, risk

neutrality has been little researched (Chiles & McMackin, 1996). Risk preferences follow a continuum from risk aversion through risk neutral to risk seeking and may affect the firm's reaction to opportunism. The third transaction dimension was transaction frequency. Williamson suggested more frequent transactions could influence firms to use a hierarchical governance structure (Williamson, 1975, 1985). Economies of scale would allow the firm to recover the cost of such a governance structure.

10.4 The intermediary and TCT

The position of the intermediary within a service-based supply chain distorts the 'make or buy' decision by adding another transactional element or node. TCT would contend that by choosing to out-source the mediating function to an intermediary, the buyer has perceived that the cost advantages offered by the intermediary plus the costs avoided from *not* transacting directly with one or more suppliers exceed the costs of transacting with that intermediary. The avoidance of the direct transaction costs between buyer and supplier is crucial to a better understanding of the value of the intermediary. Williamson has suggested that intermediaries exist in order to lower the costs of searching and negotiating in the market. This would seem to imply that the airline screening and selection costs *avoided* by the shipper by using an intermediary may be the most important transaction costs. To the buyer, the decision to internalise the intermediary function (by dealing directly with the supplier and by-passing the intermediary) would be based on whether the production cost advantages of using the intermediary *plus* the transaction costs *avoided* from using the airlines exceed the costs of transacting with that intermediary.

Some authors have suggested that the 'threatened intermediaries' hypothesis may rationalise why the intermediary may be eliminated (Sarkar, Butler, & Steinfield, 1995). This hypothesis proposes that the intermediary will be 'disintermediatised' (White, 1988) if transaction costs between the

buyer and seller are less than the total of the transaction costs between the buyer and intermediary and the intermediary and the seller:

$$T_{BS} \leq T_{BI} + T_{IS}$$

(adapted from Sarkar, Butler, & Steinfield, 1995)

However, there appears to be two mistaken assumptions here. First, rarely are only one intermediary and one seller involved. As brought up earlier a major attribute of the intermediary is his ability to consolidate the benefits of a number of vendors. If we assume the seller (potentially) deals with a smaller number of intermediaries than sellers, the total of the transaction costs between buyer and a number of sellers (T_{BS}) may well exceed the total of the transaction costs between buyer and intermediary (T_{BI}) and between intermediary and a number of sellers (T_{IS}). Thus, the transaction costs between the buyer and a number of sellers when only one intermediary is involved can be represented by:

$$\sum_{i=1}^{n} T_{BS_i} \geq T_{BI} + \sum_{i=1}^{n} T_{IS_i}$$

Second, transaction costs between intermediary and seller (T_{IS}) are not generally perceived by the buyer; they are internalised by the intermediary and may only be reflected in the price between intermediary and buyer. When writing about financial intermediation, Bester suggests search and bargaining delegation to the intermediary may offer the investor (buyer) a commitment advantage (Bester, 1995). Similarly, Yavas contends middlemen can potentially reduce two inefficiencies in search economies: the uncertainty that search efforts may not result in a match and the externalities that exist in the matching process. The middleman reduces the uncertainty and, more pertinent to this discussion, internalises the externalities (Yavas, 1992). In the context of information asymmetry, forwarders, like banks and other financial intermediaries, derive much from economies of scale (Wigand, 1997). When speaking of service-based intermediation, production cost advantages also come from economies of scale. The buyer's perception of the intermediary's costs is less important

than his perception of the value offered through the 4 Ps (Christopher, 1994). Price, as one of the 'Ps', encompasses costs. Therefore, the buyer's perception of production cost advantages that the intermediary may hold is paramount (Buckley & Chapman, 1997). By concentrating on the buyer's perception of transaction costs and ignoring actual production costs (except where they become production cost advantages and are reflected in the price) the 'threatened intermediaries' hypothesis of Barker et al now becomes:

$$\sum_{i=1}^{n} T_{BS_i} \geq T_{BI}$$

Unless the cost of transacting with a single or small number of intermediaries is exceptionally high, it is likely that the total costs for the buyer of transacting with a greater number of sellers will be higher than the costs of transacting with the intermediary.

If there are transaction-specific assets involved in the exchange, opportunism may be a driver of higher transaction costs and thus, there will be a greater tendency towards internalisation of the mediating function. With most 'pure' airfreight forwarding – that in which physical assets play little part – opportunism may arise mainly from human asset specificity. Human asset specificity has been defined as that which 'deals with the degree to which skills, knowledge, and experience of the intermediary's personnel are specific to the business process' (Zaheer & Venkatraman, 1994). This would seem to indicate that the intermediary's knowledge of both the buyer's wants and desires and the available suppliers' abilities to meet those needs can be construed as an asset specific to the transaction.

Similarly, the concept of uncertainty presupposed by bounded rationality is important to a transaction cost appreciation of the intermediary. When exchange occurs in an uncertain environment with changing requirements there exists the need for greater searching capabilities best provided by an experienced intermediary. In turn, this experience is an asset which may

lead to a production cost advantage for the intermediary (Bello, Dant, & Lohtia, 1997).

Intermediaries were earlier defined as 'organisations that support exchanges between producers and consumers, increasing the efficiency of the exchange process by aggregating transactions to create economies of scale and scope (Alderson, 1954; Coyle & Andraski, 1990). With global airfreight intermediaries this 'transaction aggregation' comes about two ways: through production cost advantages primarily through consolidation of customers' shipments and transaction cost advantages involving airline selection and negotiation and airline performance monitoring and enforcement.

10.5 Direct and indirect measures of transaction cost

The approach to transaction cost analysis: Coase versus Williamson

Direct and indirect measures imply whether one takes a Coasian approach to transaction cost analysis or an approach based on Williamson's dimensions of transaction costs. Most empirical research grounded in TCT use an approach derived from Williamson in which the relationship is examined between governance structure and the transaction dimensions of asset specificity and uncertainty (and, to a lesser extent, transaction frequency). Most of this research generally looks for a positive correlation between higher levels of opportunism and/or uncertainty and a greater degree of integration.

This indirect method based on Williamson's work can be compared to those researchers who have chosen to measure actual or perceived transaction costs directly. Gates looked at technological co-operation in the semiconductor industry using six measures of transaction costs (Gates, 1989). Noordewier et al examined acquisition costs with various industrial

buyer-vendor relationships (Noordewier, John, & Nevin, 1990). Leffler and Rucker compared lump-sum and per unit payment contracts in timber harvesting contracts using direct costs of the exchange (Leffler & Rucker, 1991). Walker and Poppo combined certain transaction costs with asset specificity in their study of the relationships between manufacturers and single-source suppliers (Walker & Poppo, 1991). Sriram et al used direct measures of transactions costs plus a measure of the buyer's dependence on his suppliers to analyse buyer-seller collaboration (Sriram, Krapfel, & Spekman, 1992). Hobbs analysed the farmer's sale of cattle through live-ring auctions versus directly to the abattoir using actual transaction costs as independent variables (Hobbs, 1996). The farmer's choice of distribution channel became the dependent variable.

As has been noted earlier, and will be discussed more fully later, Pilling et al carried out an experiment based on TCT to both explain changes in buyer-seller relationships and to test TCT's framework (Pilling, Crosby & Jackson, 1994). From this experiment, Pilling et al developed a 20 item measure of anticipated transaction costs that separated these costs into ex ante costs (developing a relationship) and ex post costs (monitoring performance and dealing with opportunistic behaviour).

Direct and opportunity costs

One of Williamson's contributions to TCT was to suggest transaction costs included both the direct costs of managing the relationships and the possible opportunity costs from making inferior governance decisions (Rindfleisch & Heide, 1997). Malone called these opportunity costs 'vulnerability costs' and described them as unavoidable costs when the situation changes and the firm is unable to adapt quickly (Malone, 1987). Rindfleisch and Heide directly relate direct and opportunity costs to Williamson's dimensions. With asset specificity, the need to protect assets can lead to direct costs of constructing safeguards and opportunity costs

from failing to invest in productive assets. Adapting to an uncertain environment can lead to direct costs from communicating to, negotiating, and co-ordinating with suppliers and opportunity costs from failing to adapt. Behavioural uncertainty requires evaluation and monitoring of the supplier. Direct costs arise both ex ante – from screening and selecting suppliers – and ex post – from measuring their performance. Opportunity costs are derived ex ante – from failing to identify suitable suppliers – and ex post – from productivity losses because of the need to make adjustments in the contract (Rindfleisch & Heide, 1997).

A major cause of direct and opportunity costs, particularly with service intermediaries, is what Rindfleisch and Heide have called the direct cost of screening and selecting suppliers and the opportunity cost of failing to identify suitable suppliers. Agency theory presupposes information asymmetry drives transaction costs in an uncertain environment. Akerlof used the term 'adverse selection' for information asymmetry when discussing the purchase of flawed automobiles (Akerlof, 1970). Intermediaries, with their presumed knowledge and experience, can reduce the ex ante direct costs and the ex post opportunity costs of finding and selecting suppliers.

Ex ante and ex post transaction costs

Ex ante costs are those generated prior to the transaction occurring. These costs arise from the development of the relationship between the buyer and the supplier. Gates further defined this as the costs of searching for and screening potential suppliers, communicating with them, evaluating them, and finally, negotiating and co-ordinating (developing an association) with them (Gates, 1989). Much of this undertaking falls under the scope of the intermediary. The tasks of searching for, finding, and relating to suppliers lie at the heart of the service intermediary.

As discussed earlier, while some writers have excluded search costs from the transaction and hence, from transaction costs, most TCA researchers include the cost of searching (Allen, 1991). The derived survey instrument of Pilling et al used items measuring screening, evaluating, and developing a relationship with a supplier but did not include searching (Pilling, Crosby, & Jackson, 1994). Williamson includes processes before the actual transaction takes place when he describes transaction costs as the 'costs of *planning*, adapting, and monitoring task completion under alternative governance structures' (emphasis added) (Williamson, 1985).

Researchers in financial intermediation place great importance on search costs (Bester, 1995). Bhattacharya and Yavas ('In Search of the Right Middleman') characterise (financial) intermediaries by their ability to reduce search costs (Bhattacharya & Yavas, 1993). Other writers who have promulgated search costs as a reason for intermediation include Demsetz ('The Cost of Transacting', 1968), Gehrig ('Intermediation in Search Markets', 1993), Rubinstein and Wolinsky ('Middlemen', 1987), and Yavas ('Market Makers Versus Match Makers', 1992).

Outside of financial intermediation research, Robins suggests transaction costs include all search costs as these costs are determined by the nature of the exchange (Robins, 1987). When researching outward licensing by Australian companies, Welch discovered that 22.8% of the total costs were search costs (Welch, 1993). In their article on cybermediaries, Sarkar et al listed searching as a service performed by intermediaries (Sarkar, Butler, & Steinfield, 1995). Majumdar and Ramaswamy include search costs as direct transaction costs when considering going direct to the market rather than using intermediaries (Majumdar & Ramaswamy, 1995). In their work on service processes, Tinnila and Vepsalainen allude to search costs as prime components of transaction costs (Tinnila & Vepsalainen, 1995). While not expressly referring to TCA, Barau et al consider search costs as fundamental to their model of Internet supplier selection (Barua, Ravindran,

& Whinston, 1997). Peng and Ilinitch also take the costs of searching as significant in their TCT approach to the use or non-use of the export intermediary (Peng & Ilinitch, 1998).

There appears to be little doubt that TCA and intermediation researchers consider the costs of searching as a major part of transaction costs. In fact, one could conceive of the buyer's cost of searching for a final supplier as a potential transaction cost 'eliminated' by using the intermediary.

Ex post transaction costs nominally include the costs of monitoring and measuring the performance of suppliers and of adapting to changes in the exchange. The latter would include dealing with opportunistic behaviour and enforcing contractual agreements including renegotiating them if required. Verification is the bête noire of ex post costs.

Research involving the financial intermediary pays more attention to ex ante costs, especially those costs arising from information asymmetry. For the buyer, ex post costs from exchange with an intermediary would appear to be similar to those from exchange directly with the seller. Again, there may be a benefit in terms of number of participants. It would be expected that the buyer would deal with a fewer number of intermediaries than sellers. Thus, the *total* ex post transaction costs (potentially or explicitly) incurred by the seller may be lowered by using an intermediary. In their 20 item survey instrument, Pilling et al looked at the costs involved in monitoring the performance of the service provider, addressing problems that might arise, and the likelihood of opportunistic behaviour (Pilling, Crosby, & Jackson, 1994).

Production cost advantages

Few TCA studies have examined the role played by production costs, concentrating instead on governance structure, transaction costs, and their

drivers (Rindfleisch & Heide, 1997). It is assumed that firms go to the market because the production cost advantages of the market players – as reflected in their price – outweigh the transaction costs incurred. The governance decision becomes one of minimising the aggregate of (internal) production costs and transaction costs.

Leaving transaction costs aside, the basic premise of production costs is that firms produce internally that which they can produce efficiently (Poppo & Zenger, 1998). However, cost is internal to a company whereas price is the guise it wears in public. What the buyer appreciates are not the costs incurred by the seller but the price (amongst other non-financial factors) at which the seller offers the product or service. The market player most likely has a price advantage over the buyer's potential production cost. This is fundamental to Porter's generic competitive strategies (Porter, 1980; Porter & Miller, 1985). Porter suggested that firms must take a low cost (and subsequent low price) strategy, a product differentiation strategy, or combine both. In TCA, production costs refer to the buyer's internal cost of providing the product or service hierarchically. This production cost is thus compared to the outsourced market price plus the transaction costs of going to that market. In other words, as Jarillo has suggested, if a vendor can provide an external price that is less than the buying firm's internal cost plus the transaction costs involved then exchange occurs (Jarillo, 1993). Perhaps the TCA concept of 'production cost advantage' should be renamed 'production cost *dis*advantage' or 'price advantage' to reflect the respective buyer or seller orientation.

Again, the inclusion of the service intermediary complicates the buyer-seller relationship. The intermediary will often offer a better price as compared to the firm's internal cost of supplying the service. This lower price should be derived from production cost advantages it garners, usually from economies of scope and/or scale. However, for all intents and purposes the buyer now compares his internal production cost with the prices offered by *two*

suppliers, the intermediary and the prime seller. Limiting this debate to price and production cost only, the buyer would decide between the two suppliers based on their comparative prices which, in turn, could be based wholly or partly on their production cost advantages. When outsourcing the mediating function to the intermediary, the buyer compares the price (consciously or not) of the intermediary's service with his own internal production cost of performing that mediating function plus the price of the prime seller. Therefore, the intermediary need not offer a lower price (and antecedent production cost advantages) than the prime seller. He simply must offer both the service and the mediating function for a similar price as the prime seller offers the service. If the buyer chooses to use the prime seller he must internalise the mediating function therefore, the prime seller's price must be correspondingly lower than the intermediary's price.

An example of offering the mediating function and service for the same price as the prime seller offers the service alone would be the air travel agent. Both the travel agent and freight forwarder are intermediaries between buyers and sellers of a transport service. Forwarders move freight, travel agents 'move' people. In both cases they are dealing with a commodity – space – which has a temporal value. Consolidation of travellers – similar to airfreight consolidation – would be provided through holiday packages and charters. Leaving aside these holiday package providers, the pure travel agent essentially offers the same product – an air flight ticket – for the same price as the airline. Production cost advantages derived from economies of scale or scope would play little part. The air travel agent obtains his income mainly from commissions paid by the airlines. As agents rather than principals, travel agents may be threatened with disintermediation (Lewis & Talalayevsky, 1997). However, as with other service intermediaries, they can also offer a reduction in certain transaction costs such as searching, screening, and relationship management costs.

As presented earlier, the service intermediary can offer a total transaction cost reduction when compared to dealing directly with a number of sellers. If, when considering the prime seller, the intermediary offers lower transaction costs *and* some sort of price advantage then the buyer will use the intermediary. The price advantage the intermediary holds over the prime seller will most likely be derived from lower production costs.

Therefore, in order to compare the intermediary with the prime seller(s) the buyer must compare two aspects. First, he would compare the prices of the two vendors and relate this to his internal cost of providing some of the processes. Within this comparison, he might include the costs of internalising the mediating function if he wishes to deal directly with the prime seller or sellers. If lower, the price offered by the intermediary would probably come from his production cost advantages over the prime seller(s). Second, he might consider the costs of transacting with the two types of vendor. It might be expected that the buyer would deal with a lower number of intermediaries than with prime sellers. Embodied here would be the transaction costs avoided. If, as propounded, the intermediary offers a lower overall transaction cost than dealing with a number of prime sellers *and* also offers a lower or equivalent price (taking into account the cost of the mediating function), then the buyer is more likely to use the intermediary then the prime seller(s).

The airfreight forwarder's price advantages, if any, over the airline come mostly from consolidation (Khan, 1993). As discussed in Chapter 3, consolidation became a driving revenue factor for freight forwarders, both in sea and air global transportation[1]. Other price advantages, based primarily on production cost advantages derived from economies of scale and scope, might come from documentation preparation and related trade services, door-to-door freight movements, collection and payment of monies, information handling, and similar value-added services.

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[1] see page 3--24

10.6 Normative use of TCA: a realist perspective

In a widely discussed article published in 1996, Ghoshal and Moran critique Williamson's version of transaction cost economics (Ghoshal & Moran, 1996; Moran & Ghoshal, 1996; Genefke & Bukh, 1997). Aside from the focus on the earlier work of Williamson while overlooking the empirical and conceptual work done in the 1980s and 1990s, one of the areas they targeted was the normative implications of TCE. Ghoshal and Moran suggested that most proponents of TCA seek to prescribe a set of normative rules for managers to follow in choosing amongst alternative governance structures rather then take a point of view that explains managerial behaviour through transaction cost economising. Heide and Stump somewhat concur in that they suggest these normative implications have rarely been empirically tested (Heide & Stump, 1995). In fact, they submit that most empirical TCE research has been descriptive, seeking to discover if firms have formed governance structures appropriate to the levels of transaction costs involved.

Robins suggested that TCA has been 'yoked to causal explanation' (Robins, 1987). The concept of *'if event x then event y'* is a burden which pulls TCA into prediction and prescription. Williamson noted that TCT has been used to rationalise virtually any economic phenomenon (Williamson, 1981). The ultimate rejoinder is that TCA infers transaction costs from organisational structure and explains organisational structure from transaction costs (Robins, 1987). Using a form of Darwinian logic of evolution as a belief in economic efficiency to explain TCA is an example of this ('survivors survive'). Elevating TCA from this sort of tautology to causal analysis is the pinnacle sought by some TCA researchers. Several writers have noted this logical culmination of TCA's application to organisational studies (Robins, 1987; Buckley & Chapman, 1997). Much of this critique is based on an evolutionary belief in the perfect market as a

natural state which evolves into hierarchies as economies become more complex.

Positive research is defined as that which "increases scientific understanding through explanation and prediction of phenomenon" (Mentzer & Kahn, 1995). Moran and Ghoshal assert that normative theory cannot be made parsimonious as can positive theory through the simplification of assumptions (Moran & Ghoshal, 1996). Wacker suggests 'good' theory is parsimonious: theories with less assumptions and fewer definitions are better (Wacker, 1998).

Most of this negative criticism of TCA is based on a positivist paradigm. The attempted discovery of regularities and causal relationships between concepts is indicative of this approach (Hirschheim, 1992). Causal explanation involves generalisation across cases and attempts to predict certain aspects of organisational structure from theoretical laws (Robins, 1987). Causal hypotheses are those in which the determination of one variable by another is inferred (Mentzer & Kahn, 1995). However, while taking a positivist approach, New and Payne suggest that formulating causal models through TCE is defensible (New & Payne, 1995). Taking a realist perspective, Whitely states that 'there are no epistemological barriers to management research being scientific in the sense of gaining knowledge of invariant causal mechanisms which operate as tendencies in open systems....' 'In management studies (*carried out under the realist banner*) the objectivity of the research may be essentially explanatory.' (Whitley, 1984, pp: 387). Explanation is defined by Outhwaite as 'the postulation of explanatory mechanisms and the attempt to demonstrate their existence' (Outhwaite, 1987, pp: 45).

Realism accepts causal relationships but in terms of causal tendencies within the real domain of reality. These tendencies lead to events in the actual domain which, when identified, become experiences and can be

observed in the empirical domain (Tsoukas, 1994). In addition, these causal tendencies arise from the interactions of generative mechanisms in the real domain but may or may not produce events in the actual domain which, in turn, may or may not be observed in the empirical domain (Outhwaite, 1987).

The retroductive research strategy employed in this research dictates the construction of a causal model, in this case drawing upon TCT. Under retroduction, if this model were to correctly represent the structures and mechanisms postulated but unobservable, the phenomena would be causally explained (Blaikie, 1993). Blaikie describes realism as 'sharing positivism's desire for producing causal explanations' (Blaikie, 1993, pp: 59). However, unlike positivism, though realism may take an objective view of the 'world out there' adherents believe it may be impossible to discern its essence. The aim of research under the realism banner becomes a search for generative mechanisms rather than predictive theories (Outhwaite, 1987).

Within the social sciences these generative mechanisms are social structures which give rise to events or human activities. Pratten contends that applying TCT under the realism paradigm precludes the concept of '*if event x then event y*' as the only way of understanding reality (Pratten, 1997). Focusing on such a limited concept means reality exists only in the empirical domain, ignoring the actual and real domains in which these mechanisms exist and events take place.

10.7 Perception and relative measures of transaction costs

Perception of costs in TCA is important and is paramount in this research. Almost invariably, past research has attempted to either measure actual transaction costs or the drivers to the transaction costs. Some TCA research has looked at 'perception' but only in terms of the effect of actual

costs on the firm's perception of a commercial relationship (Sriram, Krapfel, & Spekman, 1992 ; Sharland, 1997). Gates used measures of perceived transaction costs in his research into strategy and technological co-operation in the semiconductor industry (Gates, 1989). Buckley and Chapman specifically focussed on the perception of transaction costs and suggested it should become central to TCA (Buckley & Chapman, 1997). They asked if transaction costs could be perceived in hindsight (retrospect) or in anticipation (prospect) and suggested that, if there are two governance outcomes (*A* and *B*) with transaction costs (*X* and *Y*) such that:

$$\text{if } X > Y, \text{ then } B \text{ and if } Y > X, \text{ then } A$$

only one of the transaction costs (*X* or *Y*) would be known because only one governance structure outcome would occur. The transaction costs that affect the outcome of any governance decision are perceived by the decision maker in advance. They also suggest that, as researchers have been unable to differentiate between rationally assessed transaction costs and those that are randomly experienced, the use of perceived transaction costs might offer more formal rigour. Measuring the decision maker's perception of transaction costs supports measuring potential costs and those transaction costs that have been avoided. Potential transaction costs are those that might arise if a different course of action might be followed other than the one taken. While bearing a somewhat negative connotation, 'transaction costs avoided' implies the costs that might ensue if a maladaptive governance decision was made.

Buckley and Chapman conclude by stating 'Managerial perceptions matter, and transaction costs cannot be quantified or measured separately from these perceptions. Managers undertake a conscious (not random) selection from among arrays of potential transaction costs, and among the most important transaction costs are those which are avoided by this process. From the observer's point of view, transaction costs are thus

difficult to measure in any objective fashion (Buckley & Chapman, 1997, pp. 143).

Assessing perceived transaction costs may be more rigorous than measuring actual costs. However, this process could be complicated by separately measuring the costs incurred and those avoided. A relative measure which asks the decision maker to balance the transaction costs incurred and the potential costs which have been avoided should be satisfactory. In actuality, once the governance decision has been made, the decision maker, consciously or not, has already compared the perceived transaction costs incurred minus those perceived costs avoided against the price (production cost) advantage of the market player.

10.8 Summary

For the decision maker in the buying firm, the result of this often unconscious comparison of perceived transaction costs incurred, transaction costs avoided, and production cost (dis)advantages is the decision on whether to internalise a process by making or supplying it in-house or to outsource it to the market. For the buyer who is considering going directly to a vendor and bypassing an intermediary the decision is more complicated. The decision becomes whether or not to internalise the mediating function and deal directly or to use the intermediary.

First, the intermediary may or may not have a price advantage over the prime seller. Assuming the intermediary doesn't have any significant price disadvantage, the seller would then consider the potential costs of transacting with that intermediary. These transaction costs would be compared to the potential costs of transacting directly with the prime seller(s), often more than one. The costs of searching for, screening, and maintaining relationships with many prime sellers could exceed the cost of transacting with a lesser number of intermediaries.

On top of the searching and relational costs that appear to dominate transaction costs for service-based supply chains, are other costs derived from the perceived threat of opportunistic behaviour and from limits on the decision makers' knowledge. Opportunistic behaviour becomes problematic when the exchange involves assets specific to the transaction. Bounded rationality – the constraints on decision makers' cognitive capabilities and limits on their rationality – is manifested in uncertain environments or with unpredictable exchange partners. This potential threat of opportunistically exploiting transaction specific assets and the limits on managers' knowledge increase the cost of transacting. The costs avoided of searching for and screening a number of prime sellers – an important arrow in the intermediary's quiver – are ex ante costs due to behavioural uncertainty. As an aspect of maintaining the relationship, measuring the performance and evaluating a vendor gives rise to ex post costs also due to behavioural uncertainty. Communicating, negotiating with, and co-ordinating the actions of a vendor – another side of maintaining a relationship – generates costs due to environmental uncertainty (Rindfleisch & Heide, 1997). These costs avoided as well as any price or production cost advantage may explain the existence of the intermediary in service-based supply chains.

Chapter 11: APPLYING TCA TO THE FORWARDER/AIRLINE/ SHIPPER TRIAD

11.1 Introduction

From the literature, the concept of Transaction Cost Theory and analysis emerges from this stress on the mediating function – "What does the intermediary do for the buyer?". With an emphasis on the relational and informational aspects of the intermediary, the mediating function becomes one of searching for and negotiating with prime vendors and developing and maintaining the resultant relationships. For the buyer who uses the intermediary, the outsourced mediating functions of search, negotiation, development, and maintenance are costs avoided. These avoided costs can only be perceived in hindsight if the buyer makes the governance decision to outsource the mediating function to the intermediary.

The mediating function performed by the intermediary appears to add value in terms of transaction costs avoided (by eliminating the need to search and deal directly with a number of prime sellers). In addition, the intermediary may offer value in terms of price advantages. These price advantages often originate with the production cost advantages of the intermediary. In the case of the freight forwarder, these production cost advantages may come from consolidation and other economies of scale and/or scope. As mentioned previously, some service intermediaries, notably pure travel agents, may not offer any price advantages and might rely exclusively on the transaction costs avoided for their position in the service supply chain.

Perception of costs is important as costs avoided can *only* be perceived after the fact, not having actually occurred. Moreover, comparing perceived costs on a relative basis should be more rigorous. The buyer may compare the price advantages of the intermediary and prime seller in

relation to his own internal cost of producing the mediating function. In addition, he may compare the costs of transacting with the two vendors. Do the costs saved from not transacting with the prime seller(s) plus the price (production cost) advantages of the intermediary, if any, exceed the cost of transacting with the intermediary? Does the buyer consider the production cost of supplying this mediating function in-house against the price (production cost) advantage of the intermediary?

In this research Transaction Cost Analysis becomes the process of comparing the shipper's perception of the costs of transacting with the forwarder and airline, actual or avoided. In essence, the value of the mediating function equates to the costs of the transaction – those costs avoided with the airline minus those costs incurred with the forwarder. The value added by the intermediary (through the mediating function) becomes the combination of this mediating function or transaction costs incurred and avoided and the price advantage normally expected.

Transaction cost analysis will be used in order to explain the presence of the airfreight forwarder in the global logistics supply chain. The following diagram indicates how the shipper might analyse the in-house/outsource decision when deciding whether or not to use the freight forwarder.

TCA OF THE FORWARDER/AIRLINE/ SHIPPPER TRIAD

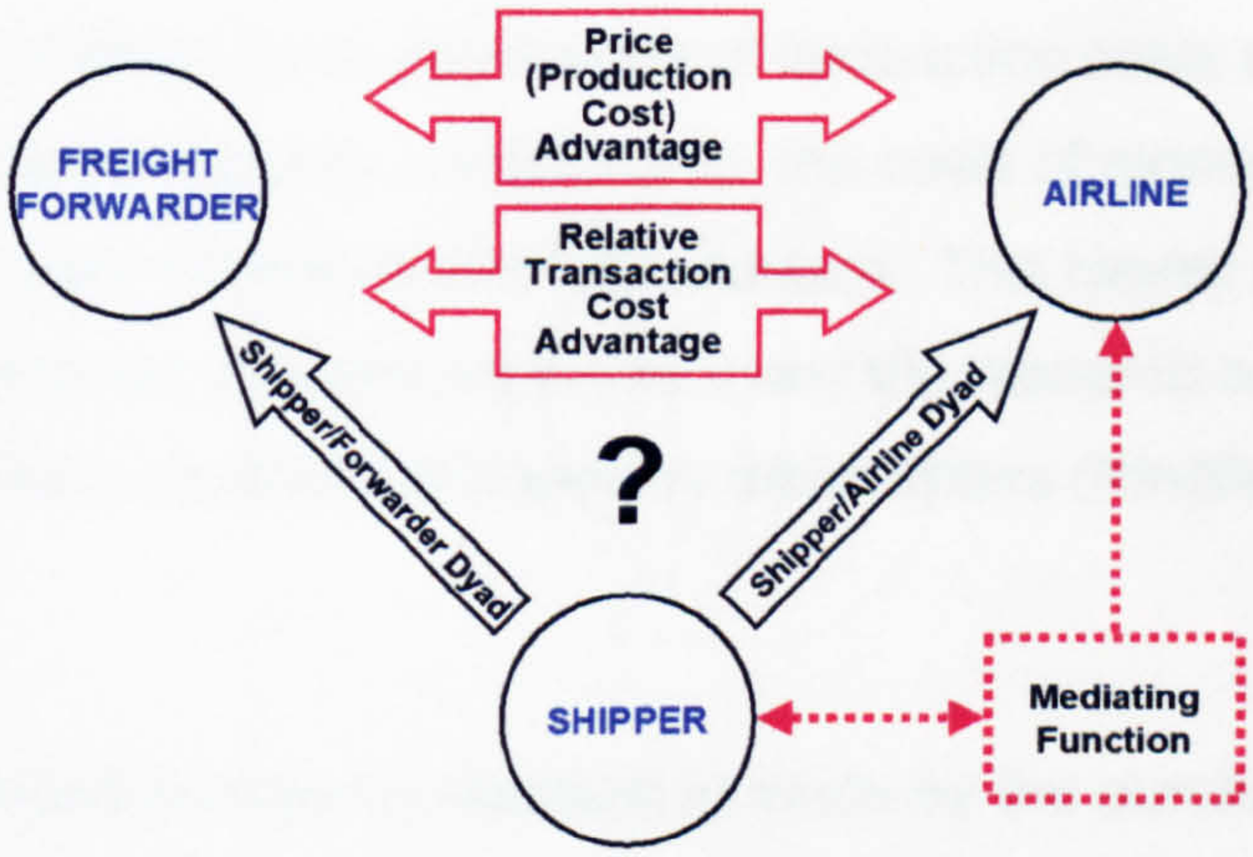

Figure 11-1

11.2 The instrument

In order to test the causal model introduced earlier, an extant scale devised by Pilling et al was adapted (see Appendix F for devised instrument used) (Pilling, Crosby & Jackson, 1994). Pilling and his colleagues developed a twenty item measure of anticipated transaction costs that focused on the ex ante costs of developing a relationship and the ex post costs of monitoring performance and dealing with opportunistic behaviour. This instrument arose from an experimental test of transaction cost theory carried out with a sample of purchasing executives in selected aerospace and electronics firms. The research design was based on a 2 x 2 x 2 between-groups factorial design in which Factor A was the level of asset specificity required to support the exchange (high or low); Factor B was the level of environmental uncertainty surrounding the exchange (high or low); Factor C was the level of frequency of the exchange (high or low). The design was balanced with 28 or 29 subjects per cell. The instrument used was pre-tested and measured anticipated transaction costs relating to the initiation and maintenance of the buyer-seller relationship. The twenty items were derived from three categories of transaction costs: developing an exchange relationship, monitoring supplier performance, and handling opportunistic behaviour. Principal components analysis yielded three significant factors which confirmed three dimensions of transaction costs as the efforts involved in developing a relationship, the costs of monitoring performance, and the costs of dealing with opportunism. This twenty item instrument originated from a closed experiment and the research behind it appeared sound, being positively critiqued by other writers (Rindfleisch & Heide, 1997).

The in-house/outsource decision is made by the purchasing side of the dyad. Some literature on relationships suggests fieldwork should be

carried out from both sides of the dyad and often specifically points out the shortcomings of doing otherwise (Phillips & Bagozzi, 1986; Frankel, Whipple, & Frayer, 1996; Gentry, 1996a; Artz, 1999). Bonoma et al insist that no dyadic study is appropriate unless a respondent from the other side is included (Bonoma, Bagozzi, & Zaltman, 1978). However, Zaltman and Bonoma also called for new methodologies to study exchange systems rather than individuals in dyadic research (Zaltman & Bonoma, 1977). In 1977 TCA was not widely known nor practised.

However, Leenders and Blenkhorn suggest that the purchasing side of the dyad is actively involved in the development, implementation, and maintenance of supplier relationships and it should be appropriate to use this side of the dyad for TCA-based research (Leenders & Blenkhorn, 1988). One must remember that the unit of analysis in TCA research is the exchange itself, not one party or the other. Kumar et al suggested the attempted use of multiple informants falters because of the difficulty in finding two or more knowledgeable informants and data collected from multiple informants often fails to agree (Kumar, Stern, & Anderson, 1993). Most TCA research has only focused on the purchasing side of the dyad though Monczka et al applied TCA to the supplier side (Monczka, Callahan, & Nichols, 1995). In their work on intermediaries and going direct to market, Majumdar and Ramaswamy appeared to examine suppliers' perceptions of the customer's perceptions of costs (Majumdar, & Ramaswamy, 1995).

Because searching was considered such an important part of the mediation function, four additional items pertaining to searching for, screening, communicating to, and evaluating proposals from potential vendors were included. Two of the original twenty items were removed as they were obvious duplications. The resultant first section of the survey was therefore made up of five parts comprising twenty two items:

1. *Searching for and evaluating:* four items

2. *Developing an association:* five items
3. *Monitoring the performance:* six items
4. *Addressing problems that might arise:* three items
5. *Likelihood of vendor taking advantage:* four items

A method commonly used to increase the measure reliability of questionnaire scales is to use multiple items for each construct (Dutta, Bergen, Heide, & John, 1995). The number of items for each construct in this research ranges from three to six. As in the original survey these items were based on a 7 point Likert scale from 'strongly agree' (+3) to 'strongly disagree' (-3) with 'neutral' (0) in the middle. There was a balance of positively and negatively worded questions in order not to influence respondents with a low-involvement attitude (Garg, 1996). The anchors for strongly agree/strongly disagree were randomly flipped amongst items to improve response validity (Ellram & Hendrick, 1995).

Each part of this first section was duplicated for both airfreight forwarders and airlines and followed one another. It was intended that respondents would be able to compare each item with its counterpart so as to provide a relative score of their perception of the costs of transacting with each airfreight vendor. It was realised that Likert scales are ordinal scales, not interval or ratio (Markoczy, 1996). As such, the use of Likert measures provides categorical data, not continuous. Categorical variables – nominal or ordinal – can be handled as independent variables in multivariate analysis by creating dummy variables. Dichotomising the categorical variables by converting them into a number of binary (0 and 1) variables allows one to measure the presence or absence of an ordinal measure (Rose & Sullivan, 1996).

It was necessary to derive relative perceived measures of transaction costs because triadic relationships involve an intermediary in addition to the prime vendor. The respondent was asked the same question twice – once for airfreight forwarders and then for airlines – in the two successive parts. It

was anticipated that the respondent would appreciate this and answer indicating the *difference* in his or her perception of the transaction cost of that item. Therefore, the raw Likert score wasn't as relevant as the direction and difference between the airline and forwarder scores. If, for one item, the respondent answered -3 (*strongly disagree*) for the airline and -1 (*slightly disagree*) for the airfreight forwarder, the difference would be 2 as it would also be if the respondent answered +1 (*slightly agree*) and +3 (*strongly agree*) for the airfreight forwarder.

Section 2 of the survey dealt with the concept of production costs as perceived by the respondents. For each of seven functions they were asked to indicate which vendor might have the cost advantage (sic). These seven functions were:

1. *freight consolidation*: the most recognisable cost advantage held by freight forwarders;
2. *documentation preparation and related trade services*: in many regions of the world, the preparation of air waybills, invoices, and similar documentation is shunned by airlines;
3. *information handling through information systems*: as discovered in the qualitative phase of the research, information is considered both a prerogative and a necessity by exporters. Both airfreight forwarders and airlines make much of their information systems;
4. *collection and payment of moneys for products and services*: while both airfreight forwarders and airlines will handle collect and COD shipments, the former are more adept at more complicated financial dealings such as letters of credit;
5. *provision of value-added services*: shippers may expect additional logistics services;
6. *provision of door-to-door freight movements*: airlines normally offer airport-to-airport services while forwarders – sub-contracted or otherwise – make door-to-door a regular part of their package;

7. *provision of extensive geographical coverage*: because airlines are passenger driven, they often target certain parts of the world though this is changing due to airline alliances. Freight forwarders advocate their global service.

These seven functions were established based on the literature, the qualitative phase of the research, discussions with both the qualitative respondents and other parties, and the writer's experience in this area.

The Likert scale for this section was 7 point ranging from 3 (freight forwarder on the left) to 3 (airline on the right) with 0 as neutral. The respondents were asked to choose which air services provider had the cost advantage by circling a number on the appropriate side. The degree to which this advantage was held by the provider would be indicated by the magnitude of the number: 1 indicating a slight advantage, 2 a moderate advantage, and 3 a strong advantage.

The third section of the survey contained items ascertaining demographic data. Of particular note is Question 6 which asked:

> *Of the shipments exported **by air** by your organisation (excluding documentation and mail) to trading regions **other than Europe** over the past 12 months approximately what percentage was shipped by dealing directly with each of the following types of airfreight suppliers?*

The intent of this question was to measure the dependent variable. The percentage of airfreight handled by airlines would be a direct measure of the degree to which the shipper had internalised the mediating function. A major advantage of this research became the relative ease of measuring the internalisation function. The concept of governance structure as the dependent variable corresponds to this measure of internalisation. Many other pieces of TCA-based research have required either a dummy variable or a multiple item conceptual measure (Monczka, Callahan, & Nichols, 1995; Dutta, Bergen, Heide, & John, 1995; Hobbs, 1996).

As mentioned earlier, Williamson postulated three dimensions of transaction costs of which frequency has often been considered the least critical (Williamson, 1975). It has generally been believed, though rarely empirically tested, that greater transaction frequency might prompt firms to internalise functions as they could recover the costs of such governance structures. Aertsen considered transaction frequency in his work on contracting out of the physical distribution function (Aertsen, 1993). In his research on international marketing channels, Klein allowed for frequency (Klein, 1989). He operationalised the construct through items such as number of shipments per month, number of orders received, and time spent by domestic personnel in foreign market (by asking for the frequency of contacts between firm and employees and foreign market agents).

In order to allow for frequency, question 1 of the third section of this research asked about the size of the shipper in terms of the number of shipments exported. From the point of view of an airfreight supplier, this is the best measure of magnitude. Question 2 asked how important exporting was to the shipper by attempting to determine the percentage revenue derived from export sales. Together, these two questions could measure frequency and the impact on the internalisation of the mediating function. Those shippers who exported a great number of shipments and/or for whom exporting was a major revenue source may be more likely to deal directly with an airline or airlines.

Questions 9 and 10 asked the respondents for the number of airfreight forwarders and airlines with which they dealt on a regular basis. Based on Williamson's reasoning, it is postulated that the shipper may be more likely to internalise the mediating function if the costs of transacting with a greater number of intermediaries exceed the potential costs of transacting directly with airlines. However, the exporter may deal with a greater number of intermediaries because of a complex trading environment with a greater number of geographic regions and/or possible routes. Because of the

transaction costs involved, if the exporter deals directly with airlines it may only be with very few of them.

This supposition was extended to the specific route and trading region in questions 7 and 8. Question 8 asked what percentage of trade into the exporter's most important region was handled by a single air carrier. It was expected that the exporter may be more likely to forego the use of an intermediary if many of his shipments go to one region. Similarly, question 4 asked about the number of consignees in the exporters most important region. A greater number of consignees in a single region could best be handled through deconsolidation and break bulk services – services which the freight forwarder is well-equipped to provide.

Questions 5 and 11 focus on the exporter's experience with other transport modes and experience with exporting in general. It is believed that the degree of internalisation will be positively related to the exporter's use of ocean freight. Extensive use of ocean freight, especially FCL freight, exposes the exporter to more freight transactions directly with ocean carriers. This may be reflected in a desire on the part of such exporters for more direct transactions with air carriers. General corporate experience in (and implicitly, knowledge of) global shipping may be positively related to the exporter's propensity to internalise the mediating function.

Question 12 brought out the terms of trade under which the respondent generally does business. It was believed that exporters who wish to control the entire exchange and freight movement and who use 'D' terms (in which control of the goods and responsibility for their movement lies with the exporter up to and often past the foreign point of entry) may be more likely to use airlines directly. Pedersen and Gray related Norwegian exporters' terms of trade to their transport selection criteria (Pedersen & Gray, 1998). Conversely, those exporters who ship via ex-works (in which the consignee

takes responsibility and control from the door of the exporter) may be more likely to relinquish the mediating function.

Earlier in Chapter 3[1] mention was made of trading within Europe as being similar to domestic trade. Pearson and Semeijn considered within-EU trade as not being global in nature (Pearson & Semeijn, 1998). Question 3 became a way to re-direct respondents' away from intra-European trade by defining 'trading regions' and patently excluding Europe from any subsequent questions. Questions 4 through 12 refer only to global shipping to trading regions outside of Europe. Those exporters who would not be considered 'global' based on these parameters could be eliminated from the analysis.

The survey was pre-tested with several of the shipper-respondents from the qualitative phase of the research and with other industrial and academic representatives in order to ensure content validity.

11.3 The population and sample

The intent of this phase of the research was to survey British respondents who would use airfreight to export their products to trading regions outside of Europe. It was expected that such respondents would use either airfreight forwarders or airlines or a combination of both in addition to integrators and couriers. By expressly excluding documentation and mail from the third part of the survey and limiting the transaction and production cost items to a comparison of airlines and forwarders it was hoped that the impact of integrators and couriers – except where warranted – would be minimal.

Sampling was carried out based on Fowler's 5 point sampling plan (Fowler, 1993). The key points in such a plan start with the choice of probability or

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[1] see page 3-22

non-probability sampling. Because the respondent focus was the British exporter who uses airfreight to trading regions outside of Europe it was felt single step probability sampling might prove difficult. With a hard-to-reach population such as this, a number of studies with non-probability samples can sometimes provide rough estimates of the proportion of the population demonstrating various characteristics. If similar results are regularly discovered with these repeated non-probability samples, the likelihood that the results apply to the population becomes greater. With non-probability sampling inferential statistical tests can still be applied but with extreme caution depending on the sampling method used. Random probability sampling is substantially a prerequisite for inferential statistics. Realistically, however, the methodological difficulties in sampling a relatively small and partially hidden population such as this prohibit probability sampling. When using non-probability sampling, inferring results to the general population may be flawed.

The second point in Fowler's sampling plan is the selection of a sampling frame. This either lists the population or the steps to be taken to identify the population. For this research, it was felt that to identify respondents who had the key parameters required it was necessary to use the customer databases of major airfreight providers. This type of non-probability sampling is called quota sampling and consists of two stages. In the first stage a set of control categories or quotas of population elements are established. For this research, the first stage became the four parameters (*British*[1] *exporters*[2] *using airfreight*[3] *outside of Europe*[4]) required. The second stage requires judgmental or convenience sampling to select the target population. If selection bias has been minimised and if the quotas in the first stage accurately reflect the target population it may be acceptable to use inferential statistical tests (Fowler, 1993).

The initial sample became the entire customer database of one of the largest freight forwarders in Britain. It was felt that the customers of such a

freight forwarder would represent all types of users of global freight services. Large freight forwarders have a varied mixture of customers: small and large, strictly one transport mode and multi-modal, global and single trading region. This might reduce the influence of the second stage convenience sampling over the first stage quota sampling.

Obviously, as customers of a freight forwarder, those British exporters using airfreight to trading regions outside of Europe would use freight forwarders for *some* of their shipping. It was hoped that they would also use airlines for a portion of their work as well. To garner data from exporters who would definitely use airlines – partially or wholly – attempts were made to survey customers of airlines as well. This proved infeasible. Those airlines asked either had relatively few non-forwarder customers or, in the case of KLM who is known for targeting shippers, were unwilling to provide any names except on a general basis.

Exclusion criteria played an important part with this sample (Markoczy, 1996). From the target population (British exporters using airfreight to trading regions outside of Europe) came a subset of freight forwarding customers. This was further redefined by the requirements for respondents and the characteristics of this subset. Of the total customer database, the munificent freight forwarder suggested approximately 85% were exporters. The balance would be carriers and other transport providers, forwarders, or customers who import only. In addition, approximately 10% of these exporters would be non-users of airfreight (i.e., motor or ocean freight only). Finally, about 20% of airfreight exporters would not ship outside of Europe. The result would be just over 60% (85% x 90% x 80% = 61.2%) of the sample would qualify. It became necessary to take a scattergun approach to hit a few targets. Response rate is based on this effective sample.

Firms do not reply to questionnaires – individuals within firms are the target. Directing the survey to more than one key informant in each firm would be

desired (Phillips & Bagozzi, 1986) but is usually difficult to achieve. This survey was aimed at those individuals within the exporting firm responsible for the export decision (i.e., logistics director, export or shipping manager etc.). Fortunately, with the freight forwarder's customer database came the names of these key individuals.

The survey was sent to all customers on the list, personally addressed to these individuals. The response rate expected (the third point of Fowlers sampling plan) was somewhere in the region of 10-20%. Therefore, in order to get a useable number of replies it was felt that the effective sample size should be near 1000 (Fowler's fourth point). With the survey form went a covering letter (Appendix F) and a prepaid return envelope. In order to improve response several methods were used. Using Dillman's Total Design Method, the covering letter stressed the importance of the (academic) research, the need for a timely response, the confidentiality of the response, and how the results of the research would benefit those who participated (Dillman, 1978). However, (university, not commercial) sponsorship and confidentiality may or may not improve response (Faria & Dickinson, 1996; Jobber & O'Reilly, 1998). Postcard reminders, second mailings, and telephone reminders as suggested by Fox et al were not followed (Fox, Robinson, & Boardley, 1998). It was felt that the use of coded questionnaires (as would be required to cost-effectively follow up on non-respondents) would not be in the spirit of true confidentiality. In addition, Jobber and O'Reilly suggest such coding – whether invisible (sic) or camouflaged as, for example, a room number – inhibits response (Jobber & O'Reilly, 1998). Finally, while stamped return envelopes promote better response, the use of business reply envelopes is considered more cost-effective (Jobber & O'Reilly, 1998) and were used. The participation of the 'sponsoring' freight forwarder was not mentioned.

An incentive of a £1 contribution to one of four charities was used as this has proved somewhat effective (Jobber & O'Reilly, 1998). The four

charities – Oxfam, Save the Children, Age Concern, and Imperial Cancer Research Fund – were chosen after consultation with respondents from the qualitative phase of the research. They felt the first two international charities would appeal to the global nature of the respondents while almost everyone is touched (eventually) by the theme of the last two organisations.

1574 surveys were sent out in the Autumn of 1998 of which 45 were returned as undeliverable. 195 completed surveys were received back of which 176 were useable giving a gross response rate of 12.8%. Using the calculated effective sample the net response rate would be 21.2% [195/((.612 x 1574) – 45)]. A response rate between 10 and 20% is not unexpected for unsolicited mail surveys in TCA or logistics research (Heide & John, 1988). With 1500 surveys sent out, Sharland had a similar response rate (14%) with 203 replies of which 191 were useable (Sharland, 1997). Murphy, Daley, and Dalenberg, cited in Chapter 3[2] for their research with freight forwarders, had a response rate of 24% when benchmarking American freight forwarders (Murphy, Daley, & Dalenberg, 1992). With another survey on American freight forwarders, Murphy and Daley had a response rate of 29.2% based on an effective sample approximately 25% lower than the gross sample (Murphy & Daley, 1996b).

As expected all qualifying respondents indicated some use of freight forwarders (Question 6: resulting in the dependent variable). However, what was unexpected was the insignificant use of airlines by these respondents. Only 17 respondents indicated *any* use of airlines and of these, only 3 indicated airline usage greater than 10% (one indicated 20% while two entered 50%). A skewed dependent variable such as this makes multivariate analysis difficult. The initial objective was to dichotomise the dependent variable (0 for *nil use of airlines* and 1 for *some use of airlines*) in order to carry our logistics regression. This would also prove skewed.

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[2] see page 3-10

Maddala suggested that using a regression model with variables such as these would give biased and inconsistent results (Maddala, 1983). In their TCA-based work on intermediaries, Majumdar and Ramaswamy faced a sample where over half the observed dependent variables (55%) was observed at the limits of 100% or 0% (Majumdar & Ramaswamy, 1995). They proposed using a 'Tobit' model (Tobin, 1958) to analyse such limited endogenous variables. Normally, it would be expected that the dependent variables would have a normal distribution. Tobin's model focuses on censored regression models in which data is available on the independent (explanatory) variables for all the observations. However, measures of the dependent (explained) variable exist only above or below a certain threshold. Censored regression models differ from truncated regression models in which observations of both independent and dependent variables do not exist above a certain threshold limit. Tobin describes his model as a cross between probit analysis and multiple regression and suggests that if there were no concentration of observations at a limit, multiple regression would be appropriate. However, with this research, as compared to that of Majumdar and Ramaswamy, the concentration near the limit approaches 90% of the observations.

Globerman and Schwindt took a pragmatic inductive approach using secondary data for their TCA-based work involving the organisation of the Canadian forest products industry (Globerman & Schwindt, 1986). Because timber mills are highly dedicated assets, mill operators would be vulnerable to opportunistic behaviour from owners of timer rights from whom the mill operators buy their timber. Therefore, under TCA, it would be expected that the mill owners would backward integrate into ownership of the timber rights. Globerman and Schwindt discovered that all but one of Canada's 30 largest forest product firms owned their own timber rights. In their research, if one views the 'market' governance structure as the dependent variable, it would only be observed in 1/30 or just over 3% of the cases. These writers concluded that the predictions of TCA matched the observed results.

Similarly, in this research in global logistics, the 'non-market' or internalised governance structure is observed in approximately 10% of the cases. However, many of these observations are of insignificant magnitude (1% to 5%).

11.4 Data transformation

The degree of internalisation (Question 6: percentage use of airlines) becomes the dependent variable (DV) while the Likert measures in Sections 1 and 2, once transformed, become the initial independent variables (IV). In order to analyse the results it was necessary to first harmonise the Likert measures in Section 1. A number of items required reversing so that all measures had a common direction. For example, the answers to A2 and A4 – as well as their airline counterparts, B2 and B4 – were reversed so that positive items (on the 'agree' side) would reflect a generally positive value of the forwarder while negative items (on the disagree side) would indicate a negative value.

Second, as discussed, in order to measure respondents' relative perception of the costs of transacting it was necessary to subtract the scores of the airline items from their corresponding forwarder items. Resultant positive figures would indicate a relative perception of lower transaction costs for the freight forwarder whereas negative values would indicate a relative perception of lower transaction costs for the airline.

In addition to calculating the difference between each pair of items in Section 1, meta-variables were created for each supplier (forwarder and airline) and for each part (search costs, development costs, monitoring costs, cost of managing problems, costs of managing opportunism). Thus, a comparison could be made of the meta-variables for search costs between airline and forwarder through t-tests and paired differences.

The measures for the Likert-type questions in Section 2 already register the respondent's relative perception of the production cost advantages of the airline or forwarder.

11.5 Data assumptions

As discussed earlier, the use of categorical data as continuous data assumes that not only is the ranking established but the interval between each ranking point is equal. Multiple dichotomy coding allows one to basically 'upgrade' ordinal data into interval data by replacing each possible response with 1 and 0 (Fowler, 1993). However, instances of the direct use of ordinal data in multivariate models (other than in log-linear analysis) are not insignificant. Novack et al used Likert scales to measure logistics value which, in turn, was analysed using multiple regression (Novack, Rinehart, & Langley, 1994; Novack, Langley, & Rinehart, 1995). In their TCA-based research examining the predictors of the relationship between a buying firm and a supplying firm, Monczka et al carried out ordinary least squares regression on their Likert data (Monczka, Callahan, & Nichols, 1995). Dutta et al performed logit model analysis for their research on dual distribution channels in which much of the data was obtained through Likert scales (Dutta, Bergen, Heide, & John, 1995). However, it should be pointed out that, in all cases, the Likert data were not used directly. All this research was analysed starting with factor analysis and subsequently used the resulting factors as variables in regression equations.

A second assumption involves the mathematical operations carried out on the Likert scale data, specifically the comparison through subtraction of the data in Section 1. The concept of ascertaining a respondent's perception by placing two almost identical Likert-type items near each other and essentially asking the respondent to differentiate between the two appears, quite likely, to be unique. It is appreciated that any error may well be

compounded. If, for example, raw scores deviated by +/- one point then the calculated difference could deviate by +/- two points.

11.6 Summary

With the data transformed into a serviceable form analysis was carried out using a variety of methods. With a dependent variable as skewed as the one in this research, multiple regression, whether or not the independent variables are 'upgraded' into continuous data or factored, would be inappropriate. Such multivariate research requires a normally distributed dependent variable or, at the very least, one that is censored or truncated to a lesser degree than the dependent variable in this research.

Chapter 12: STATISTICAL ANALYSIS – EXAMINING THE DATA

12.1 Introduction

Statistical analysis can often begin with an examination of the data on a variable by variable basis. Descriptive statistics provide information about the state of things within the sample unlike inferential statistics that would apply to the larger population. Tests of the relationships between variables and groups may indicate significant levels of association or difference. These levels of significance could lead to conclusions associated with the mathematical model proposed earlier.

Much of the analysis is based on the assumption that Likert scales generate interval data. However, it is realised there is an ongoing debate as to whether such ordered seven point scales should be considered ordinal or interval. In his well-known book on questionnaire design, Oppenheim describes scale scores as interval-type data (1992). It is also interesting that SPSS applies interval data tests to 5 point Likert scale data in their own examples. Where the data warrant it, such as when dealing with 7 point Likert scale data which can generate 7 categories, the data have been analysed and presented as categorical data. However, when dealing with a greater number of categories, such as with the differences in the shippers' perceptions of airline and forwarder (in which the category count could approach 13), the data have been accorded interval status. For example, with interval data, it is possible to provide both the mean and median. The mean can bring out nuances in the results. The two measures of central tendency together can indicate skewness in the data. In addition, when possible with this research, non-parametric tests have also been carried out. Agreement across methods should increase one's confidence in the results.

The intent of the following statistical analysis over the next two chapters is fivefold:

1. to explore, describe, and define differences in respondents' perceptions, if any, of the costs of transacting with airlines and forwarders, if possible on an TC aspect by aspect basis,
2. to explore and describe respondents' perceptions of the production cost advantages, if any, sustained by either vendor,
3. if possible, to bring together the TC results with the PC results in order to substantiate the mathematical model,
4. to explore and define associations between demographic variables and the costs of transacting with the airline or forwarder,
5. to infer, if and when possible, results to the exporting population outside of the sample.

The balance of this chapter begins with an examination of the data from the transaction cost, production cost, and demographic sections. These data will be presented graphically in addition to the measures of central tendency, variability, and symmetry. A comparison of these measures between the 22 paired transaction cost items can then be made. When comparing airline and forwarder scores it should be noted that positive values normally will reflect the respondent's perception of *lower* transaction costs. In keeping with the original research question: positive item measures and therefore, lower transaction costs correspond to a perception of greater value. When comparing item differences, the airline item is usually (though not always) deducted from the equivalent forwarder item. A positive result would then indicate a shipper perception of lower transaction costs (or greater value) on the part of the forwarder. Exceptions will, of course, be noted.

This initial examination will then be followed by a review of the reliability of the data. Cronbach's Alpha test will be carried out on the individual

transaction cost items to see if all TC items within each group are related. This will be accompanied by a confirmatory factor analysis to ascertain the direction and level of grouping within the items.

Based on a categorical data appreciation of the 22 TC items, the subsequent chapter will begin with cross tabulations being carried out to look at correlation. Differences between the two sets of 22 TC items for forwarder and airline will then be examined through Paired Samples t-tests. Scatterplots and the inclusion of a line of best fit may indicate a graphical difference between respondents' comparative appreciation of the forwarder and airline.

Finally, non-parametric tests will be run on the TC data to substantiate the statistical tests carried out previously.

The examination of the production cost advantages begins similarly to that for the transaction cost items. Both bar graphs (categorical) and histograms (continuous) will be presented to show both the direction and strength of the respondents' perceptions of which vendor holds the advantage, if any. Both reliability tests and factor analyses will be carried out to ascertain cohesion.

The demographic data obtained in the third part of the survey will first be explored as done with the TC and PC data. Descriptive statistics and graphical results will be presented. In order to examine the way different groups of respondents might perceive transaction costs, the ANOVA procedure will be carried out in Chapter 13 using the summed meta-variable for each aspect of transaction cost. This procedure might indicate if, for example, respondent size, exporting experience, use of ocean freight, or terms of trade used influences their perception of any aspect of transaction cost.

12.2 Data checking and examination

12.2.1 Transaction cost items (Section 1)

For the 22 pairs of transaction cost items, the table on the following page indicates the mean and median, the standard deviation and variance, and the skewness and kurtosis. Respondents used the full scope of measures possible: the range was 6 (minimum of –3 to maximum of +3). There were no invalid measures. Valid N was 176 and there were no missing values. In all cases the mean for the TC measures of the shippers' perceptions of forwarders (shaded rows) exceeded that of their perceptions of airlines. It should be noted again that positive values denote a perception of lower transaction costs and consequently, greater value. In 14 of the 22 pairs, the forwarder median was also greater. Standard deviation was between one and two, indicative of somewhat significant variation in individual answers to a 7 point Likert scale question.

Skewness is a measure of the symmetry of the distribution. Of the 22 forwarder items, 15 were negatively skewed indicating bunching on the right (to the positive side of zero) with a longer tail to the left. Conversely, 15 of the airline items were positively skewed with bunching to the left (to the negative side of zero) with a longer tail to the right. The standard error of skewness was .186. This skewness can be noted by comparing the means and medians. If the former are less than the latter one would expect to find negative skewness. Such skewness often comes from outliers.

Kurtosis is a measure of the concentration of data to the centre of the distribution compared to the tails. Positive kurtosis measures indicate heavy tailed distribution. Very few of the kurtosis measures were positive (three forwarder and two airline measures) indicating a concentration of data in the centre of the distribution when compared to a normal

distribution. The standard error of kurtosis was .364 which suggests some degree of central focus to the distribution.

TRANSACTION COST ITEMS (Section 1)

		Mean	Median	Standard Deviation	Variance	Skewness	Kurtosis
Searching for a vendor	Item 1	.85	1.00	1.77	3.12	-.735	-.602
	Item 1	-1.08	-1.00	1.80	3.23	.659	-.608
	Item 2	-.83	-1.00	1.63	2.66	.426	-.817
	Item 2	-1.07	-1.00	1.57	2.45	.629	-.252
	Item 3	1.06	2.00	1.60	2.55	-.786	-.271
	Item 3	-.16	.00	1.82	3.30	-.027	-1.151
	Item 4	.01	.00	1.86	3.45	-.068	-1.215
	Item 4	-.66	-1.00	1.74	3.02	.449	-.785
Developing a relationship	Item 1	1.70	2.00	1.31	1.72	-1.041	.422
	Item 1	.57	1.00	1.78	3.16	-.246	-.898
	Item 2	-.28	-1.00	1.78	3.17	.262	-1.089
	Item 2	-1.22	-2.00	1.52	2.32	.931	.339
	Item 3	1.28	2.00	1.42	2.03	-1.042	.636
	Item 3	-.31	-1.00	1.68	2.82	.150	-.867
	Item 4	-.45	-1.00	1.60	2.55	.441	-.497
	Item 4	-1.19	-1.00	1.40	1.97	.762	.507
	Item 5	.25	.00	1.68	2.82	-.123	-.970
	Item 5	-.84	-1.00	1.58	2.50	.513	-.544
Monitoring Performance	Item 1	1.07	2.00	1.73	2.98	-.673	-.653
	Item 1	-.30	-.50	1.93	3.73	.224	-1.110
	Item 2	.44	1.00	1.92	3.70	-.283	-1.252
	Item 2	-.43	-1.00	1.86	3.45	.305	-1.022
	Item 3	.10	.00	1.74	3.02	-.005	-1.083
	Item 3	-.66	-1.00	1.61	2.60	.475	-.427

continued.....

....continued

Monitoring Performance	**Item 4**	-.51	-1.00	1.84	3.39	.287	-.942
	Item 4	-.87	-1.00	1.66	2.75	.450	-.491
	Item 5	-.35	-1.00	1.78	3.16	.179	-1.135
	Item 5	-1.01	-1.00	1.59	2.52	.582	-.510
	Item 6	.09	.00	1.86	3.48	-.080	-1.227
	Item 6	-.65	-1.00	1.74	3.04	.365	-.884
Handling Prroblems	**Item 1**	1.20	1.00	1.39	1.94	-.643	.071
	Item 1	.73	1.00	1.61	2.60	-.541	-.171
	Item 2	-.48	-1.00	1.63	2.66	.348	-.797
	Item 2	-1.28	-2.00	1.37	1.87	.719	.115
	Item 3	-.61	-1.00	1.72	2.95	.350	-.912
	Item 3	-1.16	-1.00	1.43	2.03	.572	-.083
Managing Opportunism	**Item 1**	.81	1.00	1.82	3.30	-.357	-1.005
	Item 1	.43	.00	1.78	3.17	-.074	-1.033
	Item 2	.15	.00	1.76	3.09	-.075	-.915
	Item 2	-.13	.00	1.70	2.88	.079	-.718
	Item 3	.64	1.00	1.97	3.87	-.434	-1.154
	Item 3	.22	.00	1.85	3.42	-.045	-1.174
	Item 4	.44	.00	1.49	2.22	-.071	-.394
	Item 4	.01	.00	1.47	2.15	.035	-.035

a Forwarder measures are shaded

b For all variables: Range was 6, Maximum was +3, Minimum was –3, N (valid) was 176, there were no missing values, Standard error of skewness was .186, Standard error of kurtosis was .364

Table 12-1

Because the variation in a respondent's answer to a forwarder item and its matching airline item is important to this research, differences between answers were calculated. Appendix G (1) contains the descriptive statistics for these 22 differences. For discussion purposes, the descriptives for *Search* Item 1 (the forwarder score minus the airline score) follow:

SEARCH ITEM 1 (forwarder minus airline score)

			Statistic	Std. Error
Search Item 1 (forwarder minus airline score)		Mean	1.93	.15
	95% Confidence Interval for Mean	Lower bound	1.64	
		Upper bound	2.23	
		5% Trimmed Mean	1.96	
		Median	2.00	
		Variance	3.904	
		Std. Deviation	1.98	
		Minimum	-3	
		Maximum	6	
		Range	9	
		Interquartile Range	4.00	
		Skewness	.024	.183
		Kurtosis	-.612	.364

Table 12-2

For all 22 calculated variables the mean of the differences was positive and both the lower and upper bounds of the 95% Confidence Interval for Mean were greater than zero. This suggests that at the .05 level the shippers in this sample (of which, one must remember, only 10% use airlines to any degree) perceive the forwarder as offering lower transaction costs.

Again the mean and the median occasionally varied indicating skewness for that item difference. Except for *Opportunism* Item 3, skewness was invariably positive suggesting bunching to the left (though still with a positive mean/median) and a long tail to the right. The single exception appears to be due to outliers on the negative left side. Kurtosis measures usually indicated a high degree of central concentration.

Because the range of the differences could be as much as 12 (-6 to +6) histograms were used to graphically display the descriptive results. For *Search* Item 1 above the histogram becomes:

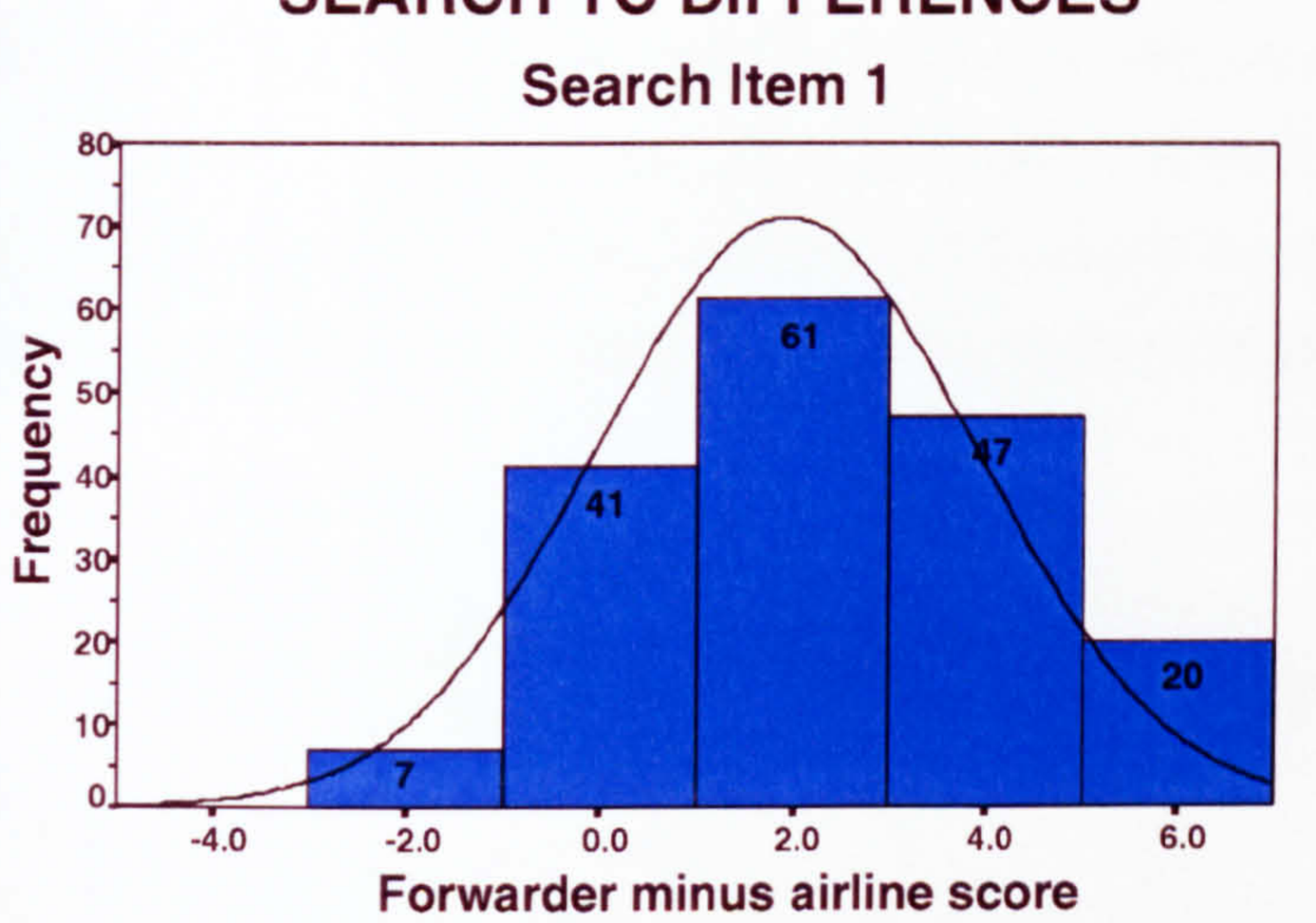


Figure 12-1

All 22 of the histograms for each paired TC item difference can be found in Appendix G (2). The positive skewness can be noted. Though these histograms are not bar charts, the dominant 'bar' is usually for measures around zero (noting that measures of –1 and +1 would be encompassed in the middle three bars). The distribution line indicates the skewness evident in the distribution of some of the measures. The bunching often occurs on zero whereas the long tail is to the right within the positive values. There are few instances of negative measures.

Another way to view this data is through the use of box plots or 'box & whisker plots' (Tukey, 1977). Appendix G (3) contains box plots of each of the TC differences grouped into the five components making up transaction costs in this research. The vertical axis is the Likert scale difference with a range up to 12 (-6 to +6). The box itself covers the interquartile range (IQR) from the 25th percentile (bottom of box) to the 75th percentile (top of box). The middle 50% of values is found within this box. The whiskers encompass values that are within 1.5 IQRs of the box edge.

Any points outside of these whiskers are outliers and, if located more than 3 box lengths out, are considered 'far out' or extreme (Tukey, 1977). The median is the line within the box.

Examining the box plot for the *search* items, one will notice that items 1 and 3 are similar in that the medians are roughly centred in the box indicating low skewness. These medians are above zero (+2 and +1 respectively) while the box and whiskers are broader than for items 2 and 4.

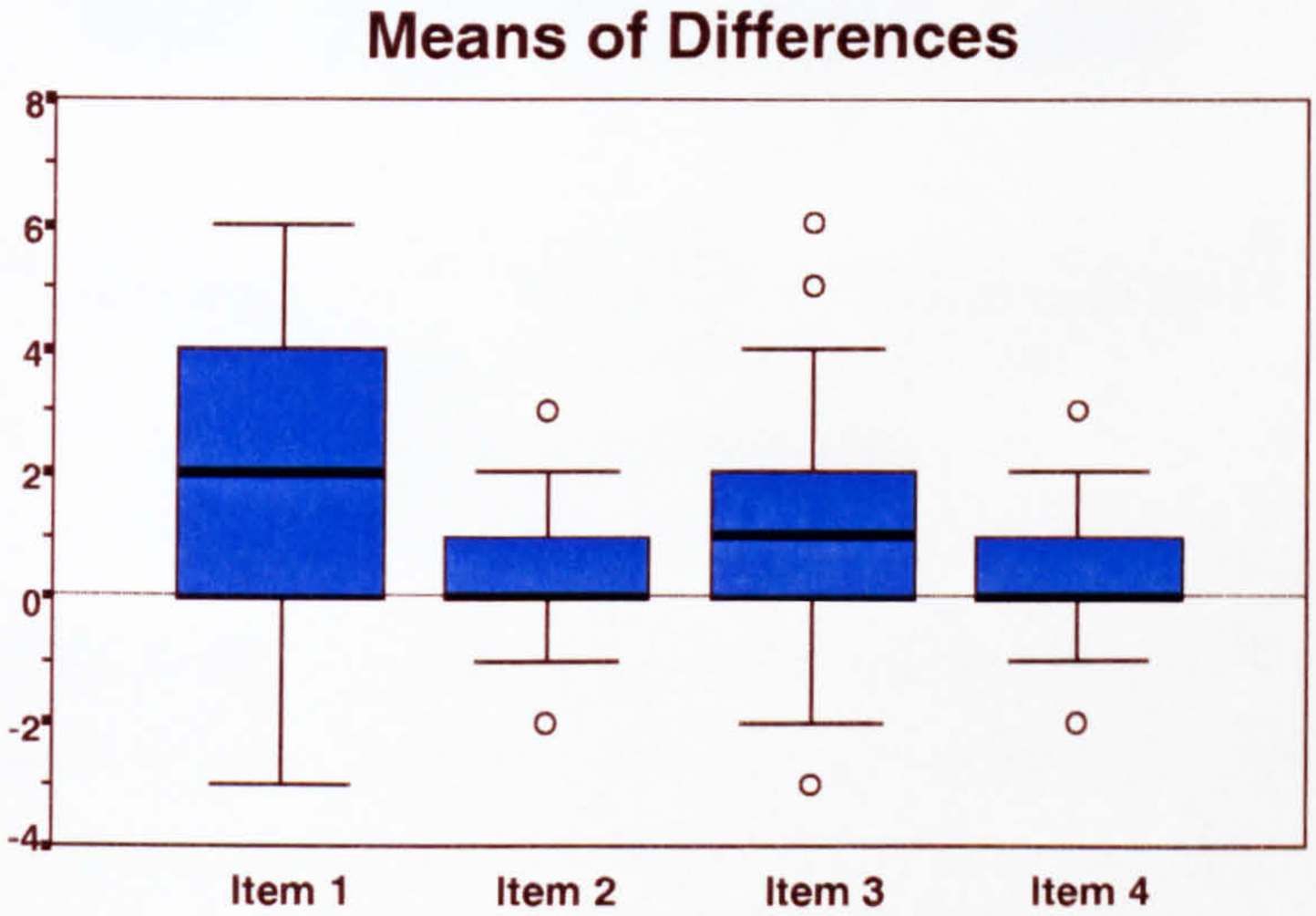


Figure 12-2

The medians for Items 2 and 4 are zero and fall at the bottom end of the box (25th percentile). This indicates positive skewness for the distribution of these values. While the medians are zero the means of the differences are positive (.24 and .67 respectively). These similarities with Items 1 and 3 and with 2 and 4 and the differences between the two pairs will be examined shortly using reliability tests and factor analyses.

By calculating the mean of each group of items it is possible to derive a box plot of all five facets of transaction costs. The IQR (those values between the 25th and 75th percentile) is less than two scale units for all five

facets. However, the range is broad for the *development* items. The IQRs are all positive as are the means though the medians for *addressing problems* and *managing opportunism* are zero. Positive values indicate the respondents' perceptions of lower transaction costs.

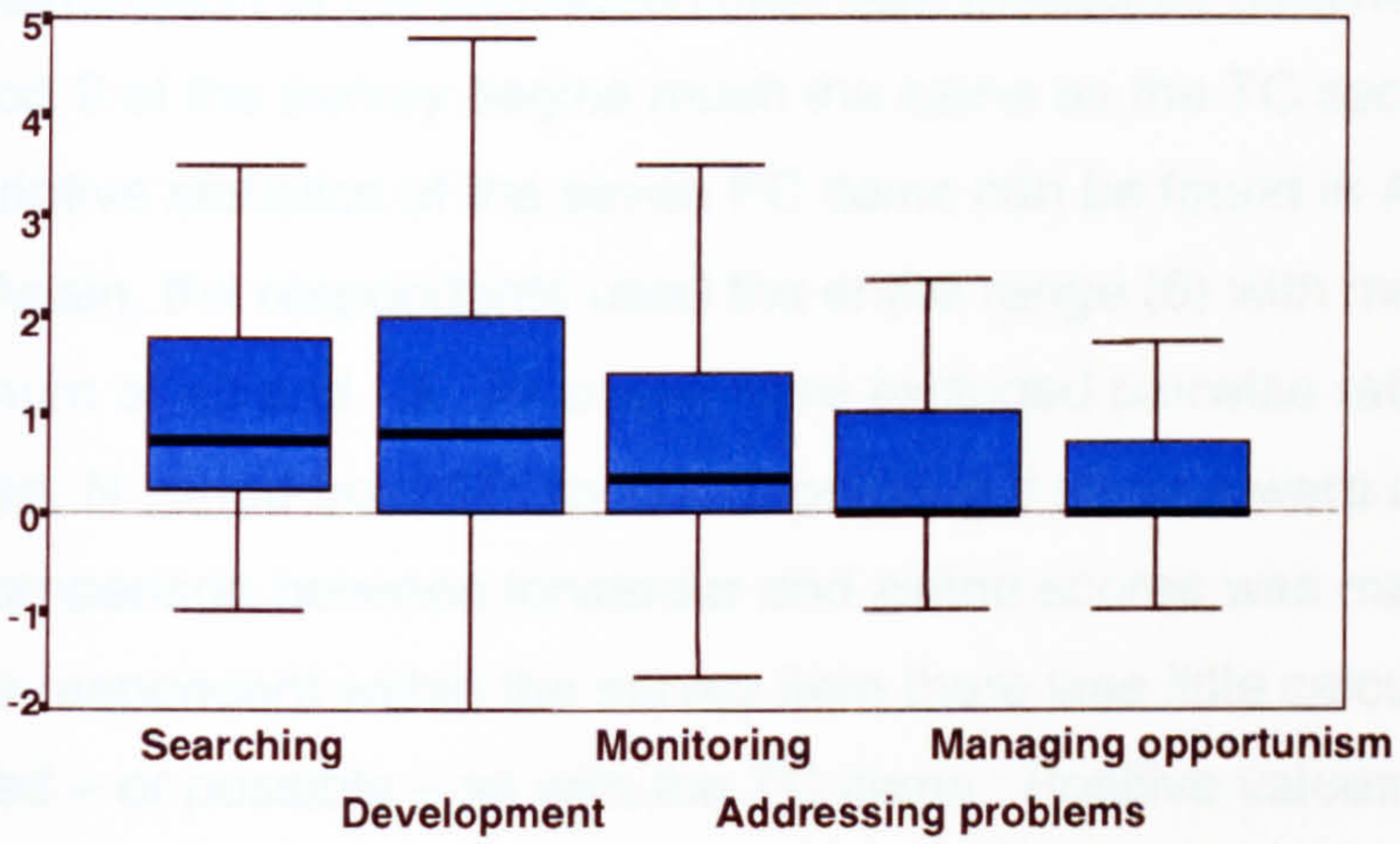


Figure 12-3

Normal probability of the TC measures can be graphically examined through Normal and Detrended Normal Q-Q Plots. While the Normal Q-Q Plots showed a straight line (hence, normal distribution) the accompanying Kolmogorov-Smirnov test (with Lilliefors Significance Correction) suggested that the sample was far from normal. The significance values for all 22 items were .000 indicating that the probability of obtaining a sample as far from normal as the observed sample would be less than .0005. However, normality is sometimes not considered important for certain tests. A large sample (one greater than 25) gives rise to a robust test of normality in which relatively small departures from normality could be significant.

The Detrended Normal Q-Q Plots allow one to specifically view the form of the deviation from normality. With these plots the location of deviations from normality can be discovered. While deviations from normal occur

throughout the distribution it is most pronounced in the tails of the distribution. Deviation is less around +/- 2 scale units of zero.

12.2.2 Production cost items (Section 2)

An examination of the production cost item measures obtained from Section 2 of the survey begins much the same as the TC section previous. Descriptive statistics of the seven PC items can be found in Appendix H (1). Again, the respondents used the entire range (6) with maximum and minimum of +3 and –3. As cases were excluded pairwise rather than listwise, N varied from 171 to 176 depending if all data were available. As the comparison between forwarder and airline scores was made directly by the respondent within the survey item there was little calculation needed – or possible – as with the TC items. Positive values (to the right) were associated with the forwarder and negative values (to the left) were associated with the airline. The range of values that could be given to either of the parties was four (0 through +/- 3). Thus, these items offer two measures: which vendor, if any, has the PC advantage and by how much?

For all seven PC items the mean was positive suggesting the advantage lay with the forwarder. The medians were also positive except that for *information handling* which was zero. Both bounds of the 95% Confidence Interval for the Mean was always positive which would reinforce the supposition that at the .05 significance level the production cost advantages were held by the forwarder.

The mean was always less than the median except for *information handling*. Smaller means would normally tend to suggest negative skewness. However, all seven items, including *information handling*, were negatively skewed. Negatively skewed distributions are depicted as bunched to the right with a long tail to the left. Of course, such statistics

as skewness and kurtosis are not particularly relevant here. These PC items are essentially three distributions: one distribution to the left of centre for those respondents who chose the airline as the possessor of the PC advantage, a second to the right for those respondents who chose the forwarder, and a third for those who made no choice (zero). Possibly, the singular benefit to these skewness measures is another indication of the propensity of the shippers in this sample to bestow the PC advantages on the forwarder. The Detrended Normal Q-Q plots suggested that normality – such that it was – was affected mostly by the airline scores.

Bar graphs of the frequencies in percent terms reflect this perception of the forwarder as PC advantage holder (see Appendix H (2)). Except for *information handling*, the 'weight' of the response lies strongly with the forwarder. Almost one-third of the response to the *Information handling* (32%) and *payment & collection* (33%) items was neutral suggesting that these shippers did not believe either party held an advantage over the other (or, by implication, over the shipper's in-house provision of these services).

Along with the bar charts, histograms can be found in Appendix H (3). The addition of a normal curve highlights the skewness and kurtosis when there is any in the data. It also emphasises the mean of the distribution and shows the general trend.

Finally, a box plot is provided to consolidate much of the information from this exploration of the production cost advantage items. It should be noted that a single normal distribution does not hold and many of the results have to be appreciated in light of this. Means, medians, the breadth of the responses, and the IQRs are appropriate.

Under TCT, this examination of the production cost items suggests that the shippers in this sample (who predominantly use airfreight forwarders)

consider the forwarder as the lower cost, and possibly lower price, provider of global logistics services when compared to the airline.

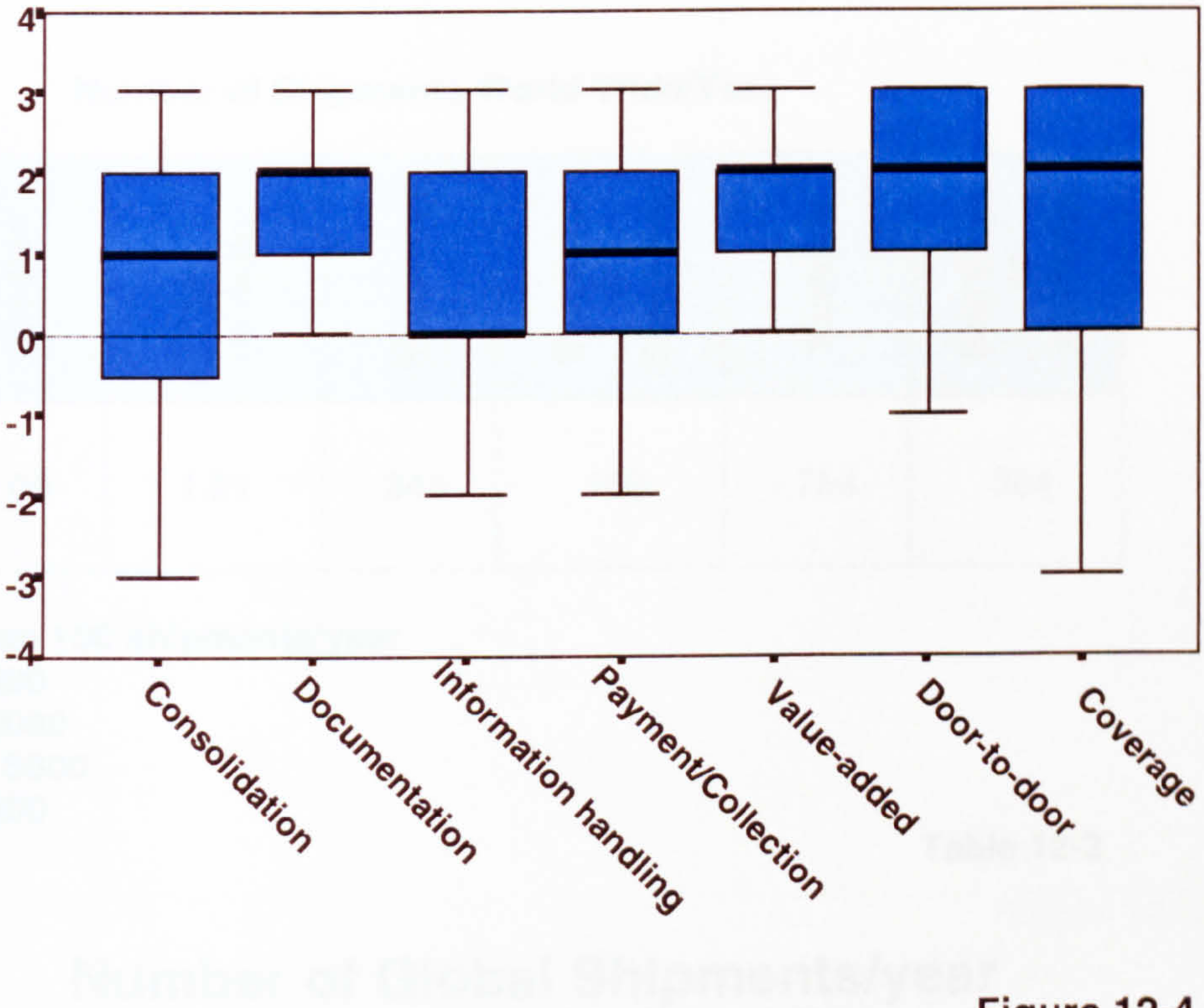


Figure 12-4

12.2.3 Demographic items (Section 3)

The demographic items in Section 3 of the survey concern attributes of the shipper that might affect his perception of the costs of transacting with the forwarder or airline. These include size of shipper (in terms of number of global shipments), importance of exporting (measured by revenue), experience of exporting and use of ocean freight, and terms of sale used. In addition, Question 6 sought to obtain the percentage use of airlines which, as explained earlier, was to have become the dependent variable in a regression equation.

First, an exploration of the data obtained results in the following. Question 1 considered the size of the shipper in terms of the number of shipments made world-wide.

Number of Shipments World-Wide/Year

Mean	Median	Std. Deviation	Skewness	Std. Error of Skewness	Kurtosis	Std. Error of Kurtosis
2.82	3.00	1.21	.343	.183	-.754	.364

1 Less than 100 shipments/year
2 100 to 500
3 500 to 2000
4 2000 to 5000
5 over 5000

Table 12-3

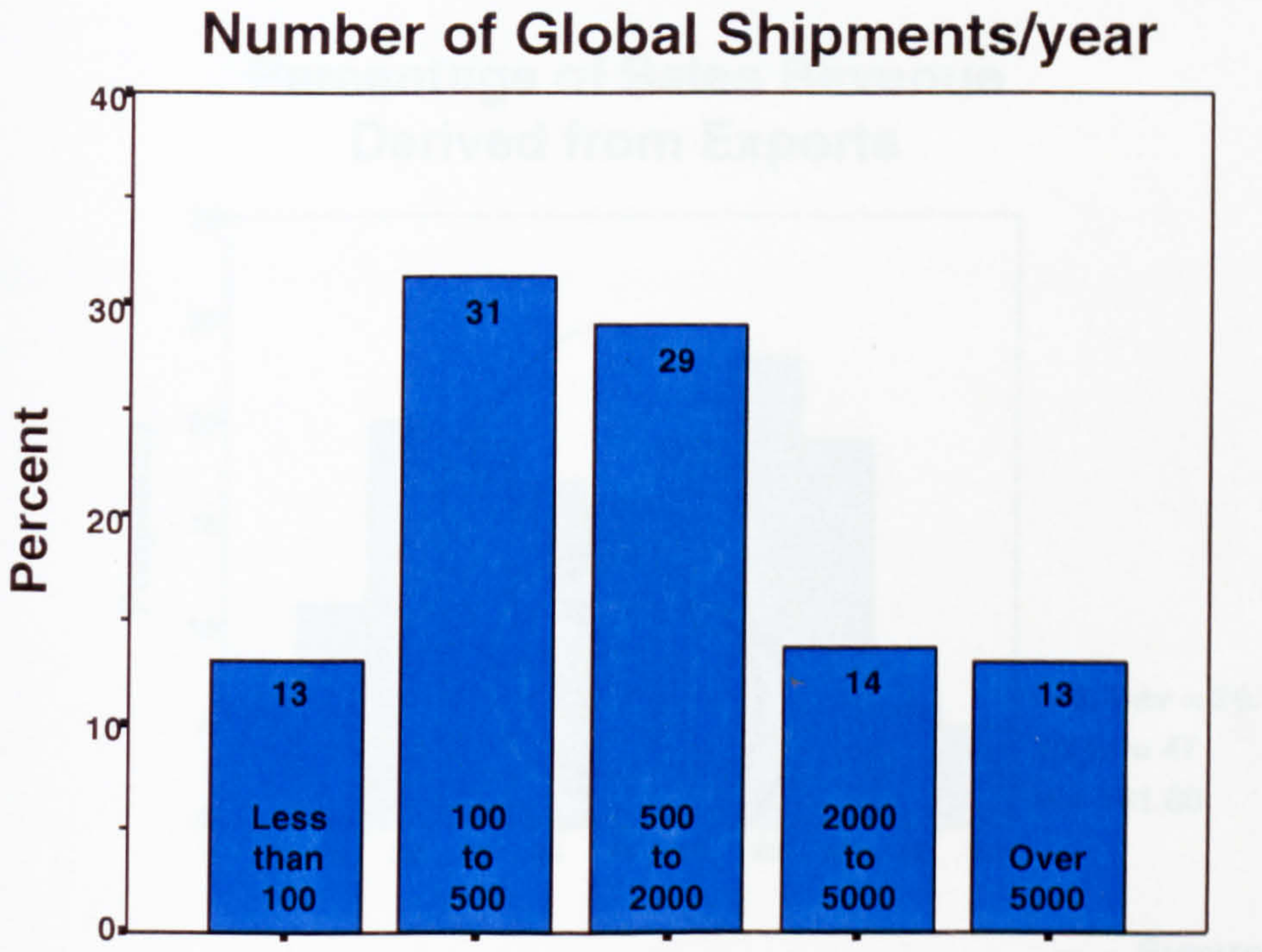


Figure 12-5

The shipper distribution by size is fairly evenly split amongst the five categories indicating a reasonable band delineation. All band sizes are represented with those respondents shipping 100 to 2000 shipments per year making up 60% of the distribution.

Question 2 sought to measure the importance of exporting to the shipper in terms of the percentage of corporate revenue derived from export markets. The resultant descriptives and histogram are as follows:

Percentage of Sales Revenue Derived from Exporting

Importance of Exporting	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	47.5	43.43	51.57	47.4	50	683.48	26.14	45.0	-.027	-1.044
Standard Error	2.06								.191	.380

Table 12-4

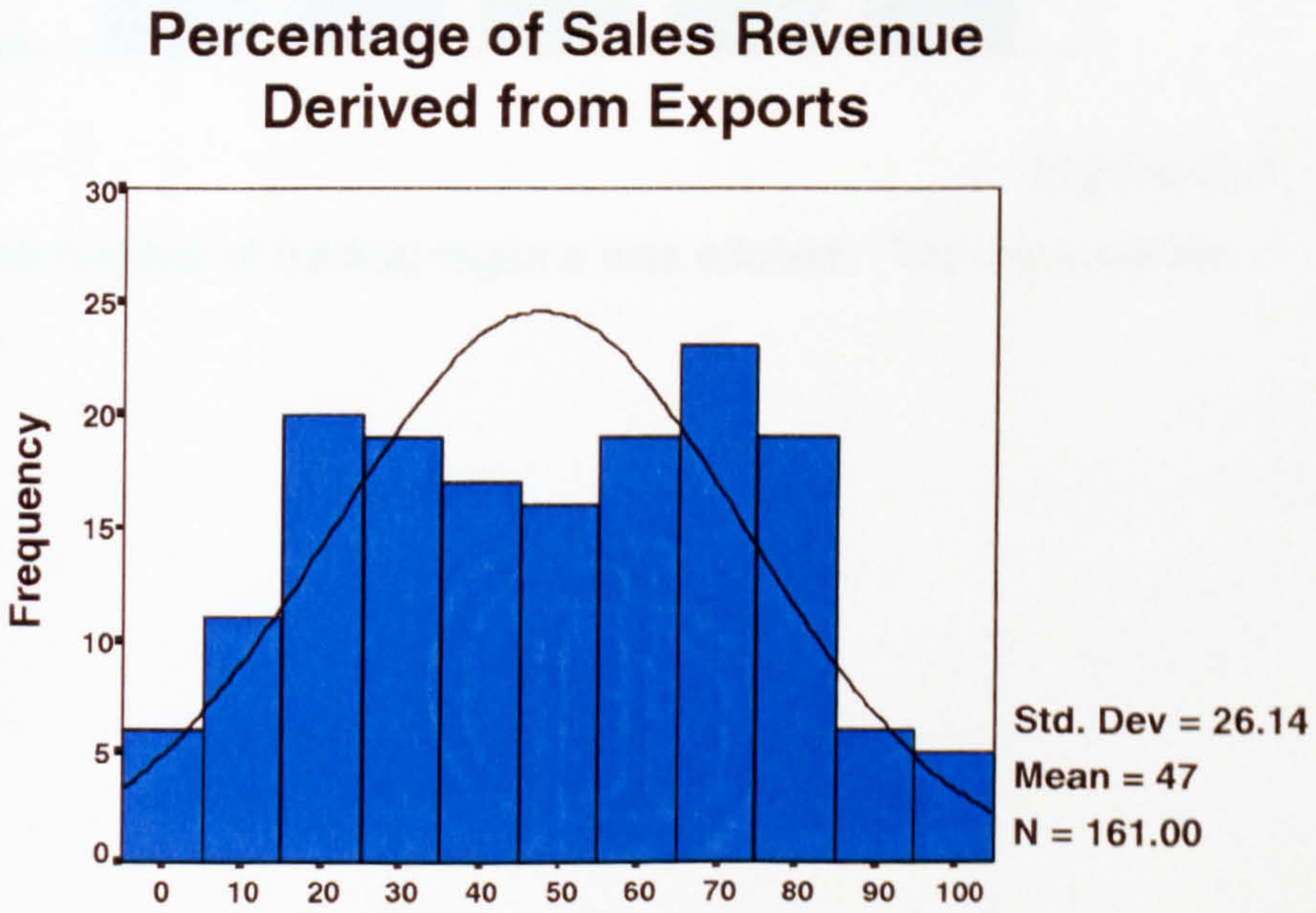


Figure 12-6

Again, shippers of all levels of export importance are represented. The distribution appears to be bimodal with two peaks around 20% and 70%.

Question 3 was designed to focus respondents on global exporting *outside* of Europe. All major trading regions of the world were represented. As expected, North America and Asia were the two regions to which the greatest number of shipments was exported.

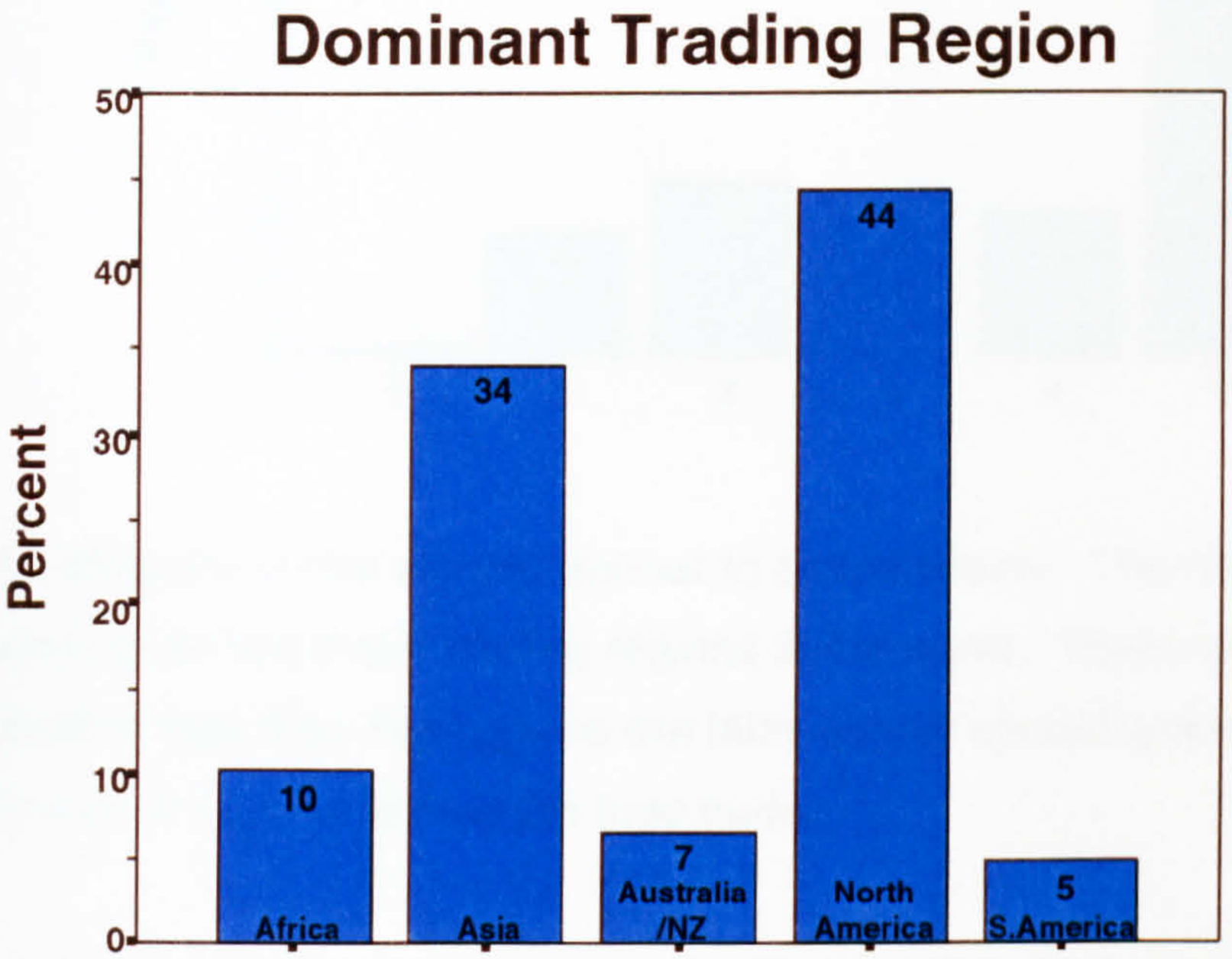


Figure 12-7

In addition, the number of trading regions was elicited. The resultant bar graph follows:

Figure 12-8

The shippers in this sample appear to export widely. The majority (52% export to all five major trading regions in the world. Those shippers who export to less than five regions are fairly evenly spread amongst the number of regions with which they trade.

The basis behind question 4 was the concept that dealing with fewer consignees in a single trading region would reduce the ability of the shipper to self-consolidate and use the airline directly. Those respondents who did export to many consignees in a single region could group the shipments and thereby reduce their costs. Freight forwarders derive much of their revenue from consolidation and it is likely their greatest cost/price advantage over the airline. However, many shippers with multiple consignees may favour the forwarder because of the difficulties and expense of handling deconsolidation in the trading region.

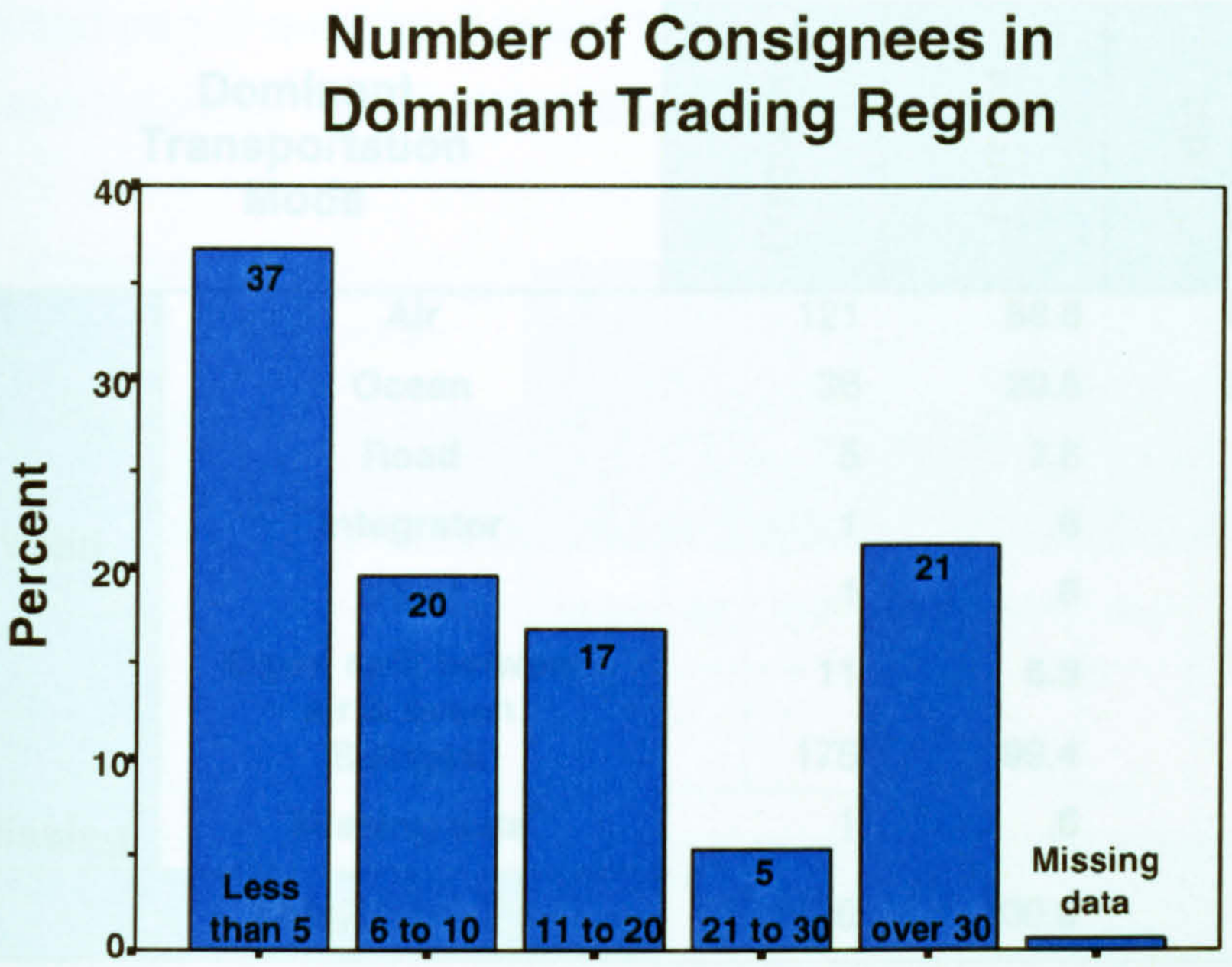


Figure 12-9

Over 1/3 of the respondents (37%) deals with less than five consignees in its major trading region. However, ¼ of the respondents ships to more than 21 consignees (26%). These multiple consignee shippers may or may not favour the airline over the forwarder.

Question 5 is a two part question that it solicits the respondent's dominant transportation mode as well as the percentage of shipments by each mode. Of importance here is the percentage use of ocean freight. Because of the strong carrier-shipper relationship in sea freight it was felt that major ocean shippers may be more likely to perceive the carrier – air or ocean – as offering a lower cost of transaction.

Dominant Transportation Mode		Frequency	Percent	Valid Percent	Cumulative percent
Valid	Air	121	68.8	69.1	69.1
	Ocean	36	20.5	20.6	89.7
	Road	5	2.8	2.9	92.6
	Integrator	1	.6	.6	93.1
	Other	1	.6	.6	93.7
	Equal split between air & ocean	11	6.3	6.3	100.0
	Subtotal	175	99.4		
Missing	Missing data	1	.6		
Total		176	100.0		

Table 12-5

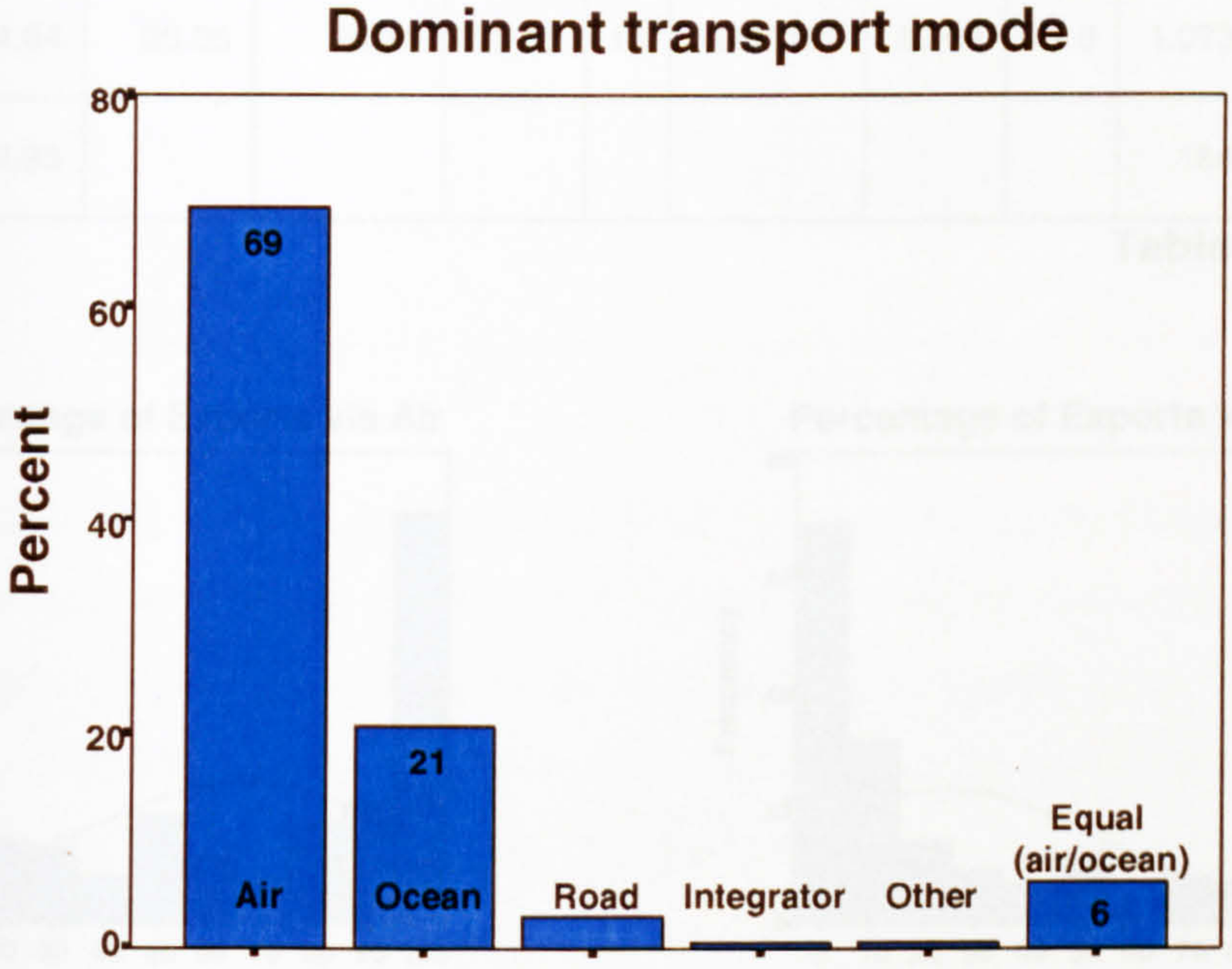


Figure 12-10

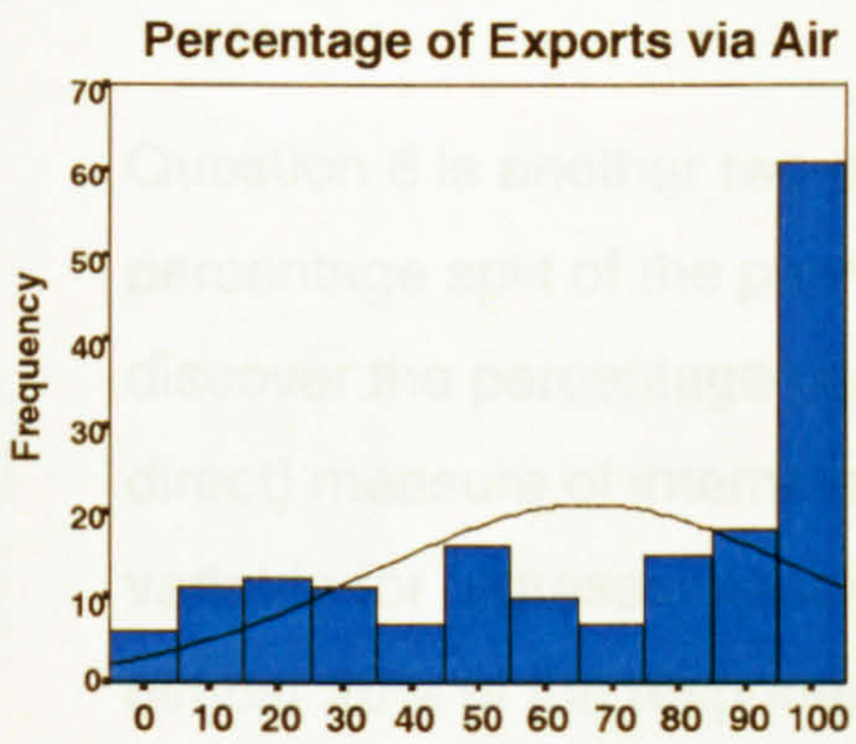
Airfreight was clearly the dominant transportation choice for the shippers in this sample, primarily used by almost 70% of the respondents. For about 1/5 (20.6%) of the respondents, ocean freight was the dominant mode of transport. The bar graph is also provided.

The second part of question 5 seeks to discover the percentage use of air and ocean freight by these respondents.

Percentage of Exports Via Air	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	66.62	61.66	71.59	68.34	80	1106.742	33.27	58.0	-.595	-1.084
Standard Error	2.51								.184	.365

Percentage of Exports Via Ocean	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	24.64	20.05	29.23	22.15	10	941.190	30.68	47.0	1.073	-.228
Standard Error	2.33								.184	.366

Table 12-6



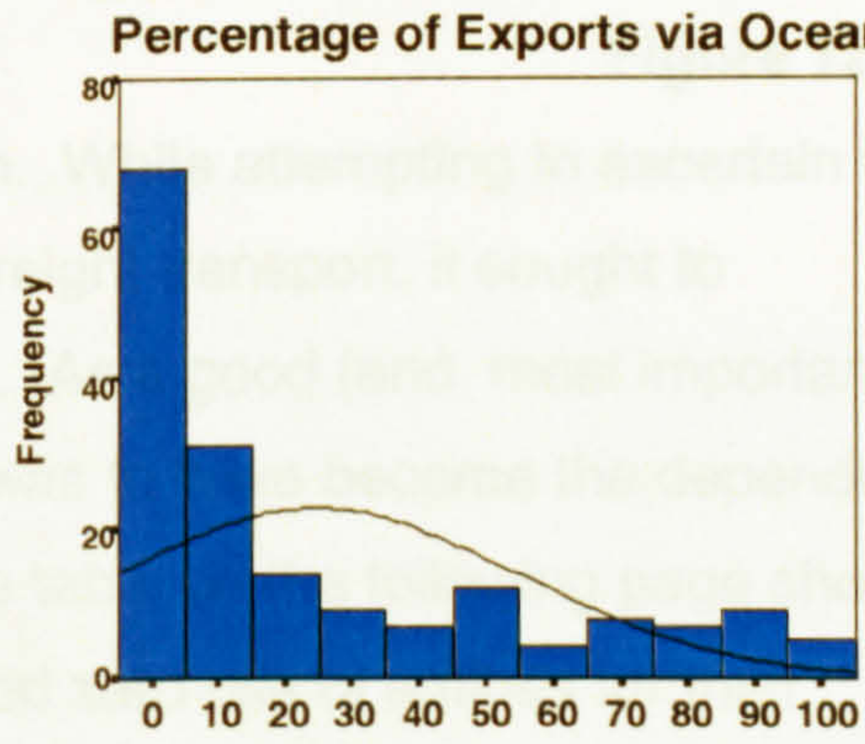


Figure 12-11

For his global shipments outside of Europe, a typical shipper-respondent in this sample would use airfreight about 2/3 of the time and ocean freight for another quarter. The balance would be split between road and

integrator. Approximately 35 to 40% of the respondents did not use ocean freight at all.

The almost mirror image of the percentage of air and ocean histograms is partially due to those two transport modes dominating, as expected, almost to the exclusion of other global transportation modes such as road or rail. This is reflected in box plots of the two percentages which appear almost an inverse of each other.

Percentage of Exports by Transportation Mode

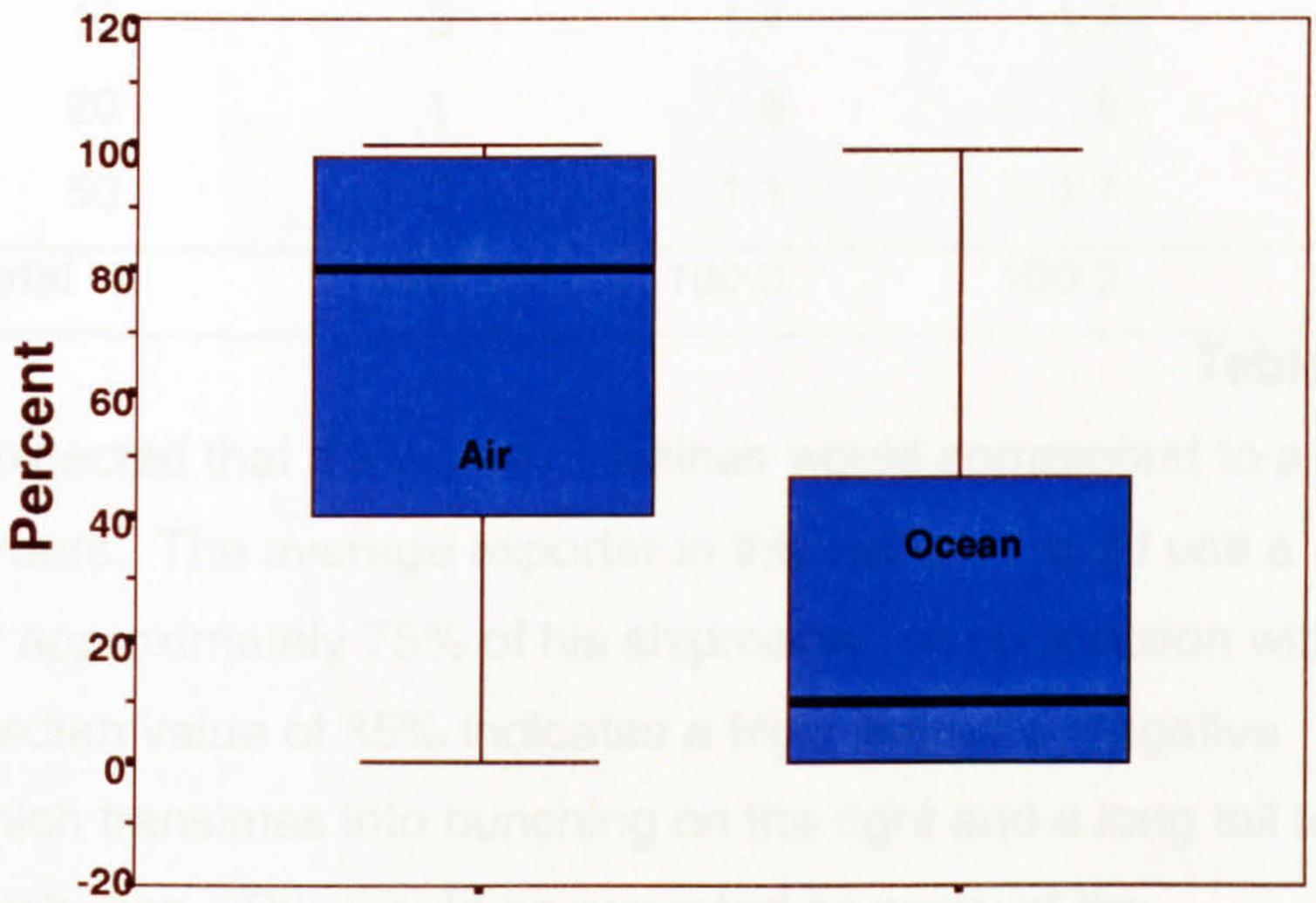


Figure 12-12

Question 6 is another two part question. While attempting to ascertain the percentage split of the providers of airfreight transport, it sought to discover the percentage use of airlines. As a good (and, most importantly, direct) measure of internalisation, this was to have become the dependent variable for regression analysis. As the table on the following page shows, almost 90% of the respondents indicated zero use of airlines for their global airfreight exporting. Only 19 respondents said they used airlines to any degree. And of those nineteen the majority (16) used an airline for less than 10% of their shipments over the past twelve months. Because of the lack of data outside of very small percentages (less than 5%), this result is best shown by the following frequency table:

Percentage Use of Airline

	Percent Use of Airline	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	157	89.2	89.2	89.2
	1	2	1.1	1.1	90.3
	2	2	1.1	1.1	91.5
	5	8	4.5	4.5	96.0
	8	1	.6	.6	96.6
	10	3	1.7	1.7	98.3
	20	1	.6	.6	98.9
	50	2	1.1	1.1	100.0
	Total	176	100.0	100.0	

Table 12-7

It would be expected that a low use of airlines would correspond to a high use of forwarders. The average exporter in this sample would use a forwarder for approximately 75% of his shipments. In conjunction with this mean, the median value of 85% indicates a high degree of negative skewness which translates into bunching on the right and a long tail to the left of the distribution. This would be expected as many of the

Percentage Use of Forwarders

Percentage Use of Forwarders	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	74.47	70.28	78.65	76.88	85	792.307	28.15	42.5	-1.106	.132
Standard Error	2.12								.183	.364

Table 12-8

respondents use forwarders exclusively (100%). The following histogram of percentage use of forwarders indicates this bunching:

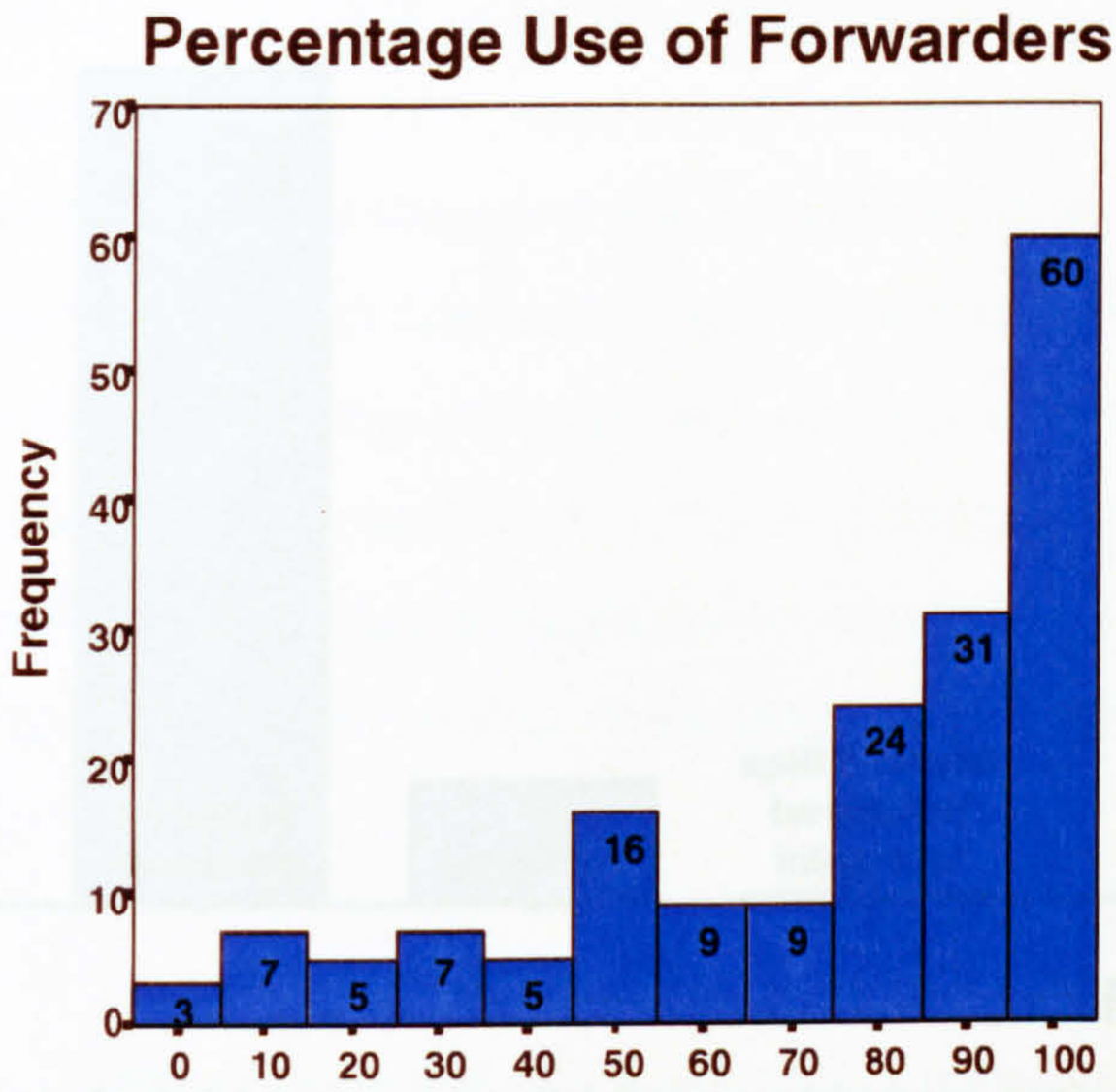


Figure 12-13

Question 7 and 8 sought to discover which single airfreight supplier transported the most shipments and how important this carrier was to the shipper. A dependency on a single carrier might indicate a sort of 'amortisation' of the costs of transaction. Using a single airfreight carrier for the bulk of one's air shipments could reduce many aspects of transaction costs such as searching for a vendor and developing a relationship.

The single airfreight supplier who transports the largest percentage of shipments is the forwarder. To the shippers in this sample, the forwarder (87%) and the integrator (13%) are the major single carriers – no respondent considered the airline as the major carrier to his most important trading region. This was not unexpected as only two shippers used airlines for more than 20% of their shipments.

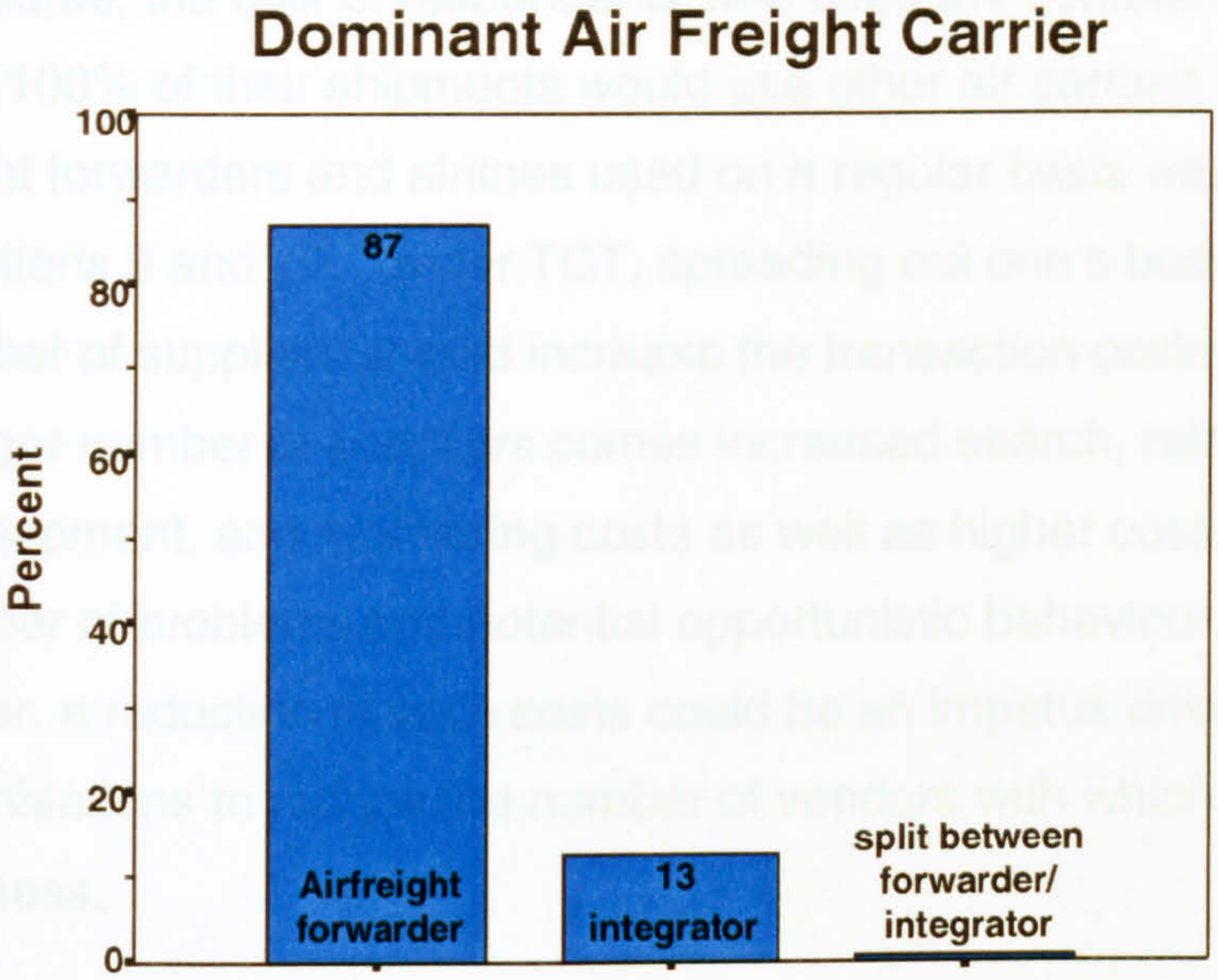


Figure 12-14

For how much of their freight transport did these shippers use this dominant carrier? The following bar chart suggests that nearly half the respondents (48%) used a single air carrier for more than 80% of their shipments to their most important trading region. And most likely, based on the dominance evidenced above, this single carrier was the forwarder.

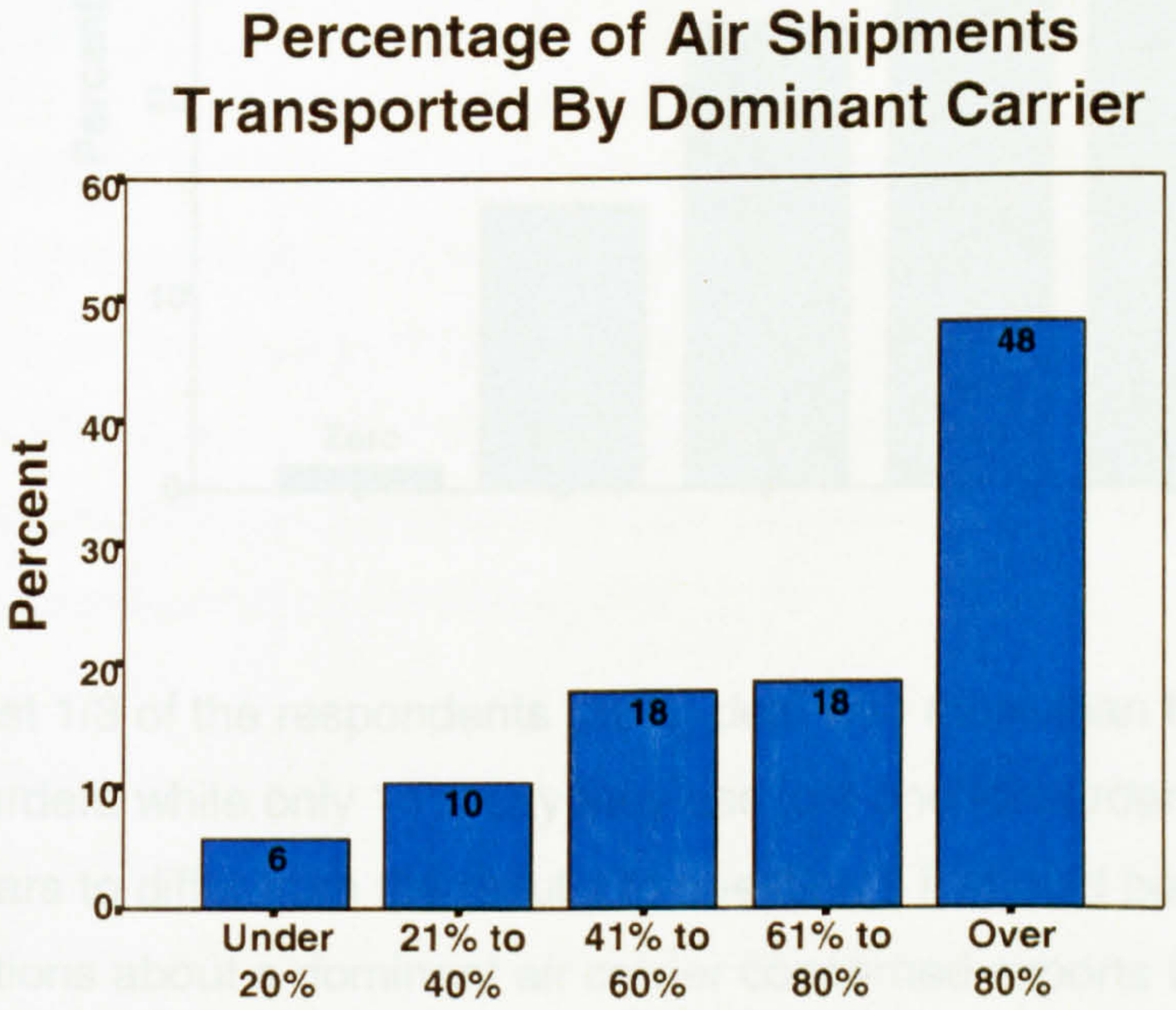


Figure 12-15

Of course, the bulk of respondents who used the dominant carrier for less than 100% of their shipments would use other air carriers. The number of freight forwarders and airlines used on a regular basis was asked in questions 9 and 10. Under TCT, spreading out one's business amongst a number of suppliers should increase the transaction costs one faces. With a larger number of suppliers comes increased search, relationship development, and monitoring costs as well as higher costs from a greater number of problems and potential opportunistic behaviour. As mentioned earlier, a reduction in such costs could be an impetus driving purchasing organisations to reduce the number of vendors with which they do business.

Number of Airfreight Forwarders With Which Shipper Deals

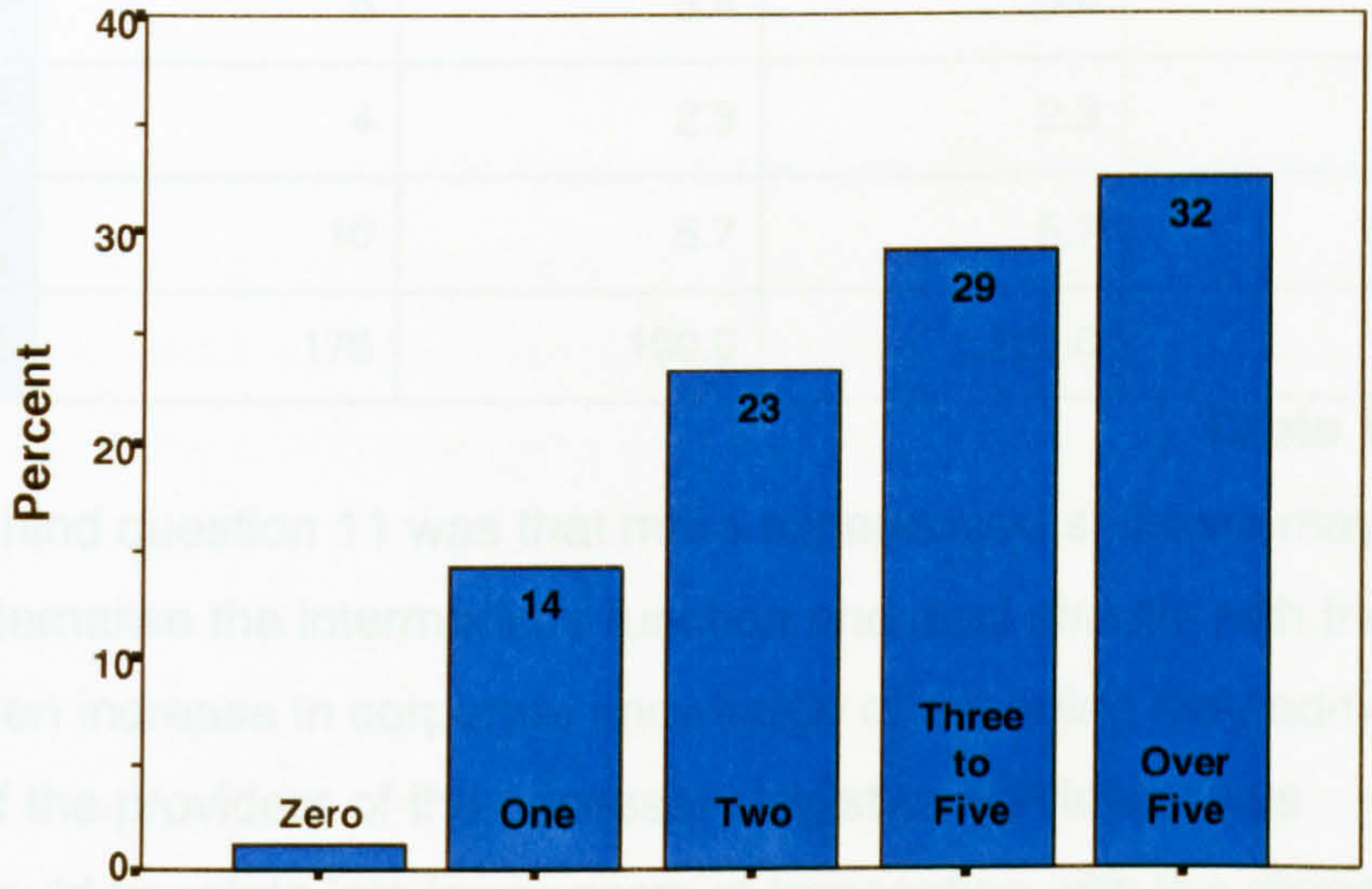


Figure 12-16

Almost 1/3 of the respondents (32%) deal with more than five freight forwarders while only 14% say they use just one forwarder. While this appears to differ from the results to question 8 it should be noted that the questions about a dominant air carrier concerned exports to the single most important trading region. Questions 9 and 10 relate to air exports world-wide. The implication from this could be that the shippers in this

sample may use one forwarder to their primary trading region but another – or additional – forwarders to other trading regions to which they export.

Again, as expected, most of the shipper-respondents did not use an airline at all (84%) though this should have been similar to the percentage use of airlines in question 6 (89%)! The remaining 16% was fairly evenly split between using one or more airlines.

Number of Airlines	Frequency	Percent	Valid Percent	Cumulative Percent
No airlines	**148**	**84.1**	**84.1**	**84.1**
One airline	8	4.5	4.5	88.6
Two airlines	6	3.4	3.4	92.0
Three to five airlines	4	2.3	2.3	94.3
Over five airlines	10	5.7	5.7	100.0
Total	176	100.0	100.0	

Table 12-9

The basis behind question 11 was that more experienced shippers may be inclined to internalise the intermediary function and deal directly with the airline. With an increase in corporate knowledge of exporting may come awareness of the providers of the necessary logistics services. This awareness could translate into lower costs of transacting with the direct suppliers of transportation services.

On a corporate basis, the majority of respondents (86%) have exported outside of Europe for over ten years. Very few (<2%) have less than five years experience and none would admit to having less than one year experience. This would suggest that most of the respondents in this

sample are very experienced, corporately, with exporting and, presumably, with the providers of the necessary services.

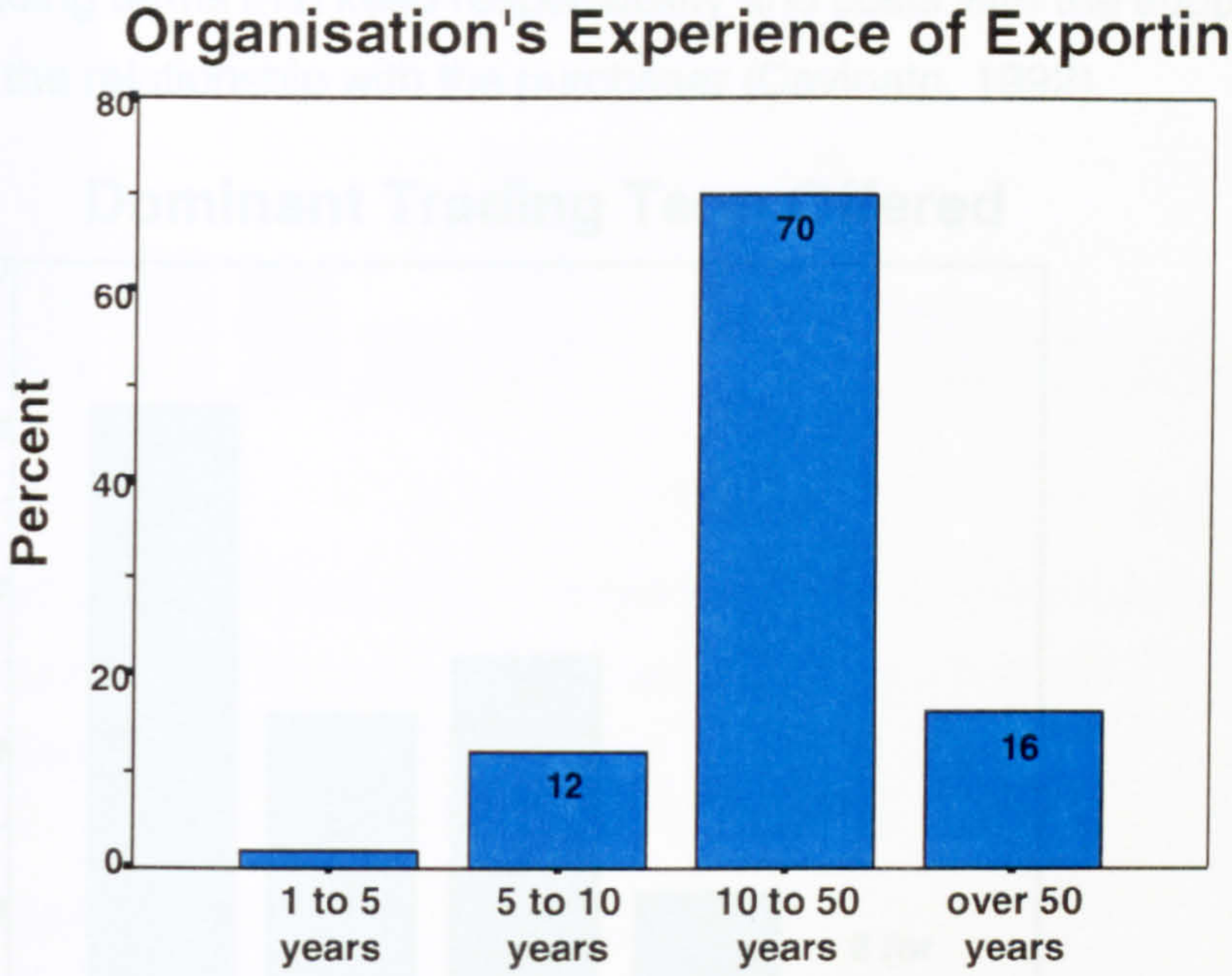


Figure 12-17

The final question asked the respondents about the terms of trade under which they did business overseas. It was surmised that those shippers who use ex-works or F-type terms would either use a freight forwarder or leave it up to the purchaser (who would probably use a forwarder also) to move the shipment. Those shippers who use D-type terms (in which ownership and responsibility lie with the shipper at least into the purchaser's country) might be more inclined to deal directly with the carrier. However, the latter may also favour the forwarder in order to keep control of the goods until final delivery.

Approximately 40% of the respondents in this sample continue to use ex-works terms of trade. While not particularly germane to this research, the use of ex-works trading terms by the shipper-seller suggests a low tolerance of the costs of transacting with the purchaser. Those exporters for whom ex-works terms predominate have made few alterations from their normal domestic method of selling. The 1/3 of respondents (36%)

who use C and D-type trading terms have taken on more responsibility for the goods and more control of their supply chains. Cavinato suggested that using trading terms that keep responsibility and costs with the supplier add value to the relationship with the purchaser (Cavinato, 1992).

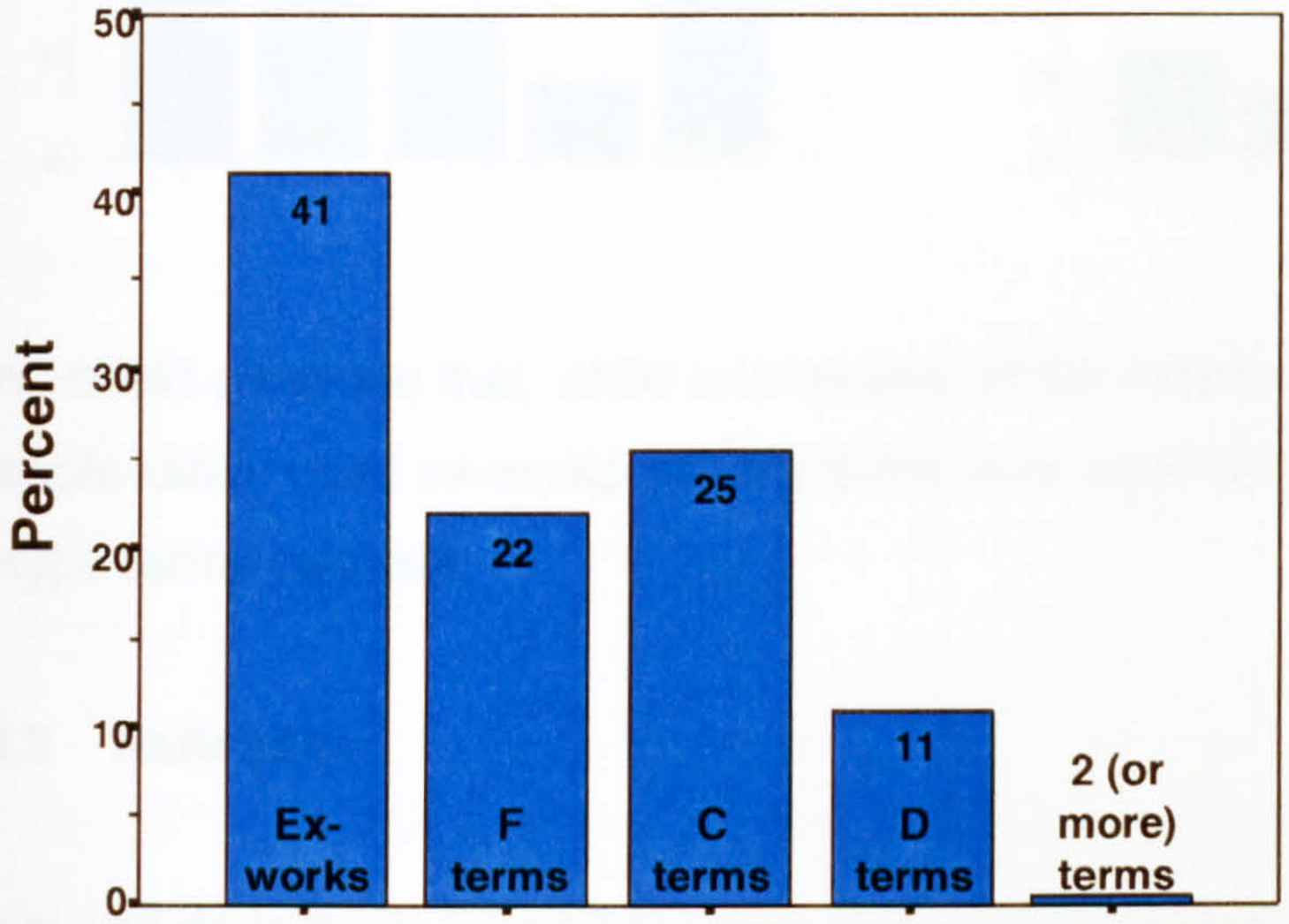


Figure 12-18

Where 40% of the respondents primarily used ex-works terms, another quarter (25%) of respondents ranked them very low in use (less than 4th overall). Only 1/3 of the respondents (35%) appeared to actually rank ex-works terms outside of the primary or rarely used ranking. However, while a similar percentage (36%) ranked D-type terms of secondary or lesser importance, the bulk of the respondents – over one-half – (53%) rarely used D-type terms.

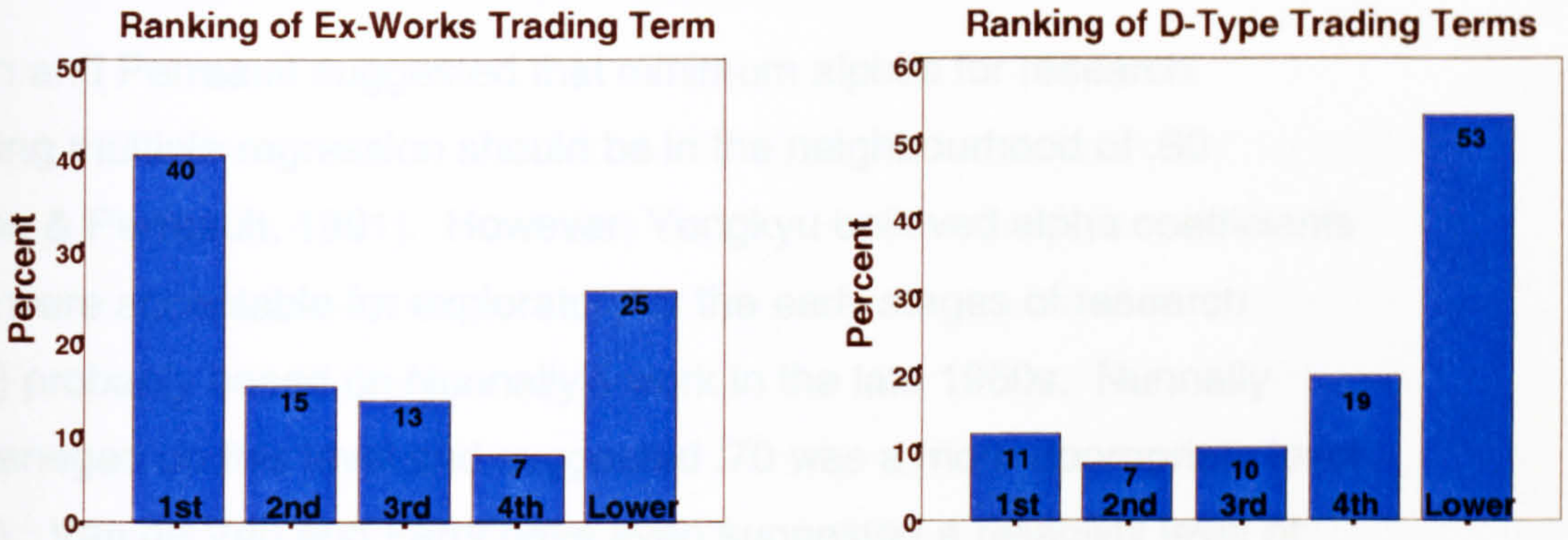


Figure 12-19

One could conclude that, while one-quarter of the respondents in this sample rarely used ex-works trading terms over one-half did not consider D-type terms relevant.

12.3 Reliability

How well does each TC and PC item statistically measure the single concept with which it is associated? Is each group of items internally consistent? Cronbach's Alpha test was carried out on the individual transaction cost and production cost advantage items to ascertain if they are related within each of the five categories of transaction costs.

Except for the *handling problems* item, Alpha coefficients ranged from .5793 for *searching (forwarder)* to .7882 for *monitoring performance (airline)* (see Appendix I (1)). Deleting some items (such as Forwarder search 1, Forwarder develop 1, Airline develop 1, Forwarder monitor 4, Airline monitor 4, and Forwarder opportunism 3) improved the alpha but not to any great a degree.

However, *handling problems* had a reliability problem with item 1 for both forwarder and airline questions. Alpha coefficients with item 1 included were .4060 and .2208 respectively. With item 1 deleted the Alpha coefficients greatly improved to .7584 and .7082.

Mason and Perreault suggested that minimum alphas for research involving multiple regression should be in the neighbourhood of .60 (Mason & Perreault, 1991). However, Yongkyu believed alpha coefficients of .50 were acceptable for exploratory or the early stages of research (1998) probably based on Nunnally's work in the late 1960s. Nunnally later reneged on this level and suggested .70 was a more appropriate level (1978). Van de Ven and Ferry have even suggested a reliability level of .40 is acceptable (1980). With figures approaching and exceeding .60 (with Problem item 1 deleted) for all categories it is felt that these items are reliably associated with the single TC concept which they are measuring. All future analysis of the TC variables will be carried out both with and without Problem item 1.

Cronbach's Alpha test was also carried out on the seven production cost advantage items. The results are in Appendix I (2). The Alpha coefficient for the seven items was .6197 and there were no reliability benefits to deleting one of the items.

12.4 Factor analyses

In order to measure unidimensionality in the variables (discriminant validity) confirmatory factor analysis using principal components analysis (PCA) and principal axis analysis – both with the addition of Varimax rotation – was carried out. The intention of factor analysis is many-fold. It is often used to condense data into a smaller set of variables without losing information or to extract a set of dimensions that are hidden in a large set of variables. The initial intention in this research was to identify appropriate variables for subsequent logistics regression but the skewed dependent variable concerning percentage use of airline made that impossible.

12.4.1 Transaction cost items (Section 1)

Using multiple items for each construct is a common practice to increase reliability of questionnaire scales (Dutta, Bergen, Heide, & John, 1995). Confirmatory factor analysis can be used to assess the convergence of the measures. Do these measures represent the concepts they are intended to represent? Principal Components Analysis (PCA) was used on a concept by concept basis using the differences between the 22 forwarder and airline scores. Tables showing the total variance explained from initial eigenvalues through extraction sums of squared loadings to rotation sums, if applicable, can be found in Appendix J (1).

The items making up the *Development, Opportunism*, and *Problem* conceptual groups loaded onto a single factor. The latter was especially interesting as Problem Item 1 had shown not to be reliable in Cronbach's Alpha test. PCA was run on the *Problem* group of items both with and without Item 1 included. As expected, deleting Item 1 improved the loading for the remaining two items. The *Search* items split into two factors as did the *Monitor* items. The two factors making up the *Search* group explained almost 74% of the variance.

The component matrices can be found in Appendix J (2). As both the *Search* and *Monitor* group of items loaded onto two factors the results were Varimax rotated and the two rotated component matrices are included. The *Search* items seemed to split into two components with Items 1 and 3 loading onto component 1 and Items 2 and 4 loading onto component 2. The reader should recall the discussion concerning the box plots of these four items earlier in this chapter[1]. An examination of these four items highlights the point that items 2 and 4 were reversed from 1 and 3. This reversal was done to promote response validity (Ellram & Hendrick, 1995). It also entails balancing positively and negatively worded

[1] see page 12-9

questions (Garg, 1996). As the *Search* groups of items – forwarder and airline – were the first questions asked of the respondents it is possible they interpreted them incorrectly. The reversed items were returned to their original direction and the computation of the differences and factor analysis was run again. The results were identical other than the negative values of the loading of the secondary component.

Item 4 was the only item out of the six *Monitor* items on which component 2 loaded. It was also a reversed item though there were two other items (Items 2 and 5) which were also reversed but, like the other three items, factored onto component 1. It should be noted that Cronbach's Alpha test for reliability indicated that deleting the *Monitor* Item 4 for both forwarders and airlines resulted in only a very slight improvement in the reliability coefficient[2].

Running Principal Axis factor analysis, again with VARIMAX rotation where applicable, produced similar results except for the *Monitoring* items. This analysis resulted in only one component though the loading on Item 4 was small (.146).

Finally, confirmatory factor analysis based on Principal Axis factor analysis (with VARIMAX rotation) was carried out to assess the convergence of the difference measures (Appendix J (3)). All five *Development* items loaded on factor 1; five of six *Monitor* items (excluding Item 4) loaded on factor 2; all four *Opportunism* items loaded on factor 3; and two of the three *Problem* items (excluding item 1) loaded on factor 4. *Search* items 1 and 3 loaded on factor 1 along with the *Development* items while *Search* items 2 and 4 were the only two items for which factor 5 was the major component. This difference was discussed earlier. The two exceptions – *Monitor* item 4 and *Problem* item 1 – both loaded on factor 3 along with the *Opportunism* items.

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[2] Forwarders: .7376 to .7397 – Airlines: .7882 to .8188

In general, convergence seems adequate except for the split in the four *Search* items. Possibly, the respondents consider *Search* items 1 and 3 similarly to the *Development* items and *Search* items 2 and 4 separately. Conceptually, *Search* items 1 and 3 suggest the initial discovery aspects of searching while items 2 and 4 suggest evaluation.

12.4.2 Production cost items (Section 2)

Factor analysis, both with PCA and Principal Axis factoring was carried out on the seven production cost items. The intent was to look for common concepts within the data. Both the table of variance explanation and the rotated component matrix may be found in Appendix J (4). The initial rotated component matrix resulted in two components. Component One appeared to encompass those variables relating to services outside of the actual physical movement of the goods – the raison d'être of the forwarder and airline. These items were *documentation*, *information handling*, *payment & collection*, and *value-added services*. Component Two embodies *door-to-door* services and *extent of coverage* which are directly related to the actual transportation of the goods. *Consolidation*, which many would see as the most important benefit of the forwarder, seems to overlap both components. It may be that *consolidation* is looked upon both as a direct transportation service and as an extraneous service.

The astute reader will note that the cut-off eigenvalue limit of 1.0 eliminated a third component from the analysis. The usual limit of 1.0 is often considered heuristic and can, if conditions warrant it, be changed (SPSS, 1997). An eigenvalue slightly below 1.0 (such as the third component eigenvalue of .930) can still account for variation amongst several variables. Finally, it is important to realise that factors must make conceptual sense. Factors with eigenvalues over 1.0 can be dropped and

those with eigenvalues under 1.0 can be retained depending on the interpretation.

Bringing in the third component leads to a different interpretation of the factors. The three groups or factors which now load on the variables could be entitled: 'supplementary services', 'geographical items' and 'physical movement'.

Component	Title	Variables primarily associated
One	Supplementary services	Information handling, Payment & collection, Documentation, and Value-added services
Two	Geographical items	Door-to-door services, Extent of coverage
Three	Physical movement	Consolidation

Table 12-10

Consolidation is almost isolated with Component Three loading on it to the greatest degree. Component One primarily loads on *information handling*, *payment & collection*, *documentation*, and *value-added services* though there is some degree of loading from Components Two and Three as well. *Information handling* and *payment & collection* certainly bear Component Three as a secondary component. Without trying to read too much into the data, perhaps information about the physical location and ETA of the goods ties this variable into Component Three (the physical movement factor). Similarly, *documentation* relates to the physical movement of the goods (consider Customs clearance) as well as the various documents required for foreign countries (geographic factor). Accounting functions such as payment and collection are important in the foreign country and directly affect the physical movement of the goods. Finally, Component Two loads mostly on the 'geographic items' - *door-to-door* services and *extent of coverage*.

Principal Axis factoring was also carried out and came up with similar results to PCA.

12.5 Summary

In this chapter the transaction cost, production cost advantage, and demographic data from the three sections of the survey have been examined. With the TC data there appears to be a visual and statistical contrast between the shippers' perceptions of the transaction costs of dealing with a forwarder and those costs of dealing directly with an airline. The calculated difference between these two perceptions is significant and positive in the forwarder's favour. Likewise, the perception of the shippers in this sample is that the forwarder holds the production cost/price advantage over the airline.

The demographic data indicates this sample consists of a wide range of shippers in terms of size, exporting importance, global trading regions, number of forwarders used, modal use, and trading terms. These data will be analysed in relation to the respondent perception of transaction costs in the next chapter.

Overall, the TC data appear reliable and generally measure the singular concept under which they are grouped. The exception has been noted and the tests in the subsequent chapter will be run with and without *Problem* Item 1. The PC items seem to cluster under three general areas: geographical, physical, and supplementary.

Chapter 13: STATISTICAL ANALYSIS – MEASURING ASSOCIATION BETWEEN CATEGORICAL TC VARIABLES

13.1 Introduction

One would expect to see some sort of relationship between the two sets of TC data: those sets measuring the shippers' perceptions of the costs of transacting with the forwarder and with the airline. The intent of the research was to let the respondents compare their perceptions of costs. Thus, the difference between each pair of items was of primary importance.

Data obtained from ordinal Likert scales is technically considered categorical. However, as explained earlier, tests for continuous data are often used. Therefore, in order to reduce the risk associated with basing the analysis purely on continuous tests and to verify the results, both types of tests were employed.

The following analyses first look at the transaction cost items, using cross-tabulation tests for categorical data followed by t-tests for continuous data. In addition, scatterplots were prepared to give the reader a graphical description of the paired relationships. This was followed by non-parametric tests partly for verification and triangulation reasons. After examining the matched pairs of transaction costs this chapter then focuses on the shippers' demographic variables and their influence on the shippers' perceptions of the costs of transaction.

13.2 Cross tabulations

A comparison between these data sets begins with examining association. Cross tabulation tables are often used to examine possible relationships amongst categorical variables. When using crosstabs the null hypothesis

becomes the assumption that there is no relationship between the two variables. If the calculated probability of obtaining as large a sample effect randomly is small, one can reject the null hypothesis and conclude there is an effect in the population. A rejection of the null hypothesis that there is no relationship between a matched pair of TC variables would suggest that respondents considered each pair of TC variables in Section 1 together.

Appendix K (1) contains the Chi-Square test results for the 22 pairs of items. Except for *Development* item 3 (probability of .003) all the items had a significance value of less than .0005 (displayed as .000). This would seem to indicate that there is a significant difference between the two sets of data. The chi-square tests used – Pearson, likelihood ratio, and linear by linear – all resulted in large measures suggesting strong disagreement between the results and the null hypothesis that there is no difference between the data sets.

However, with a relatively small sample size such as in this research (N = 176), the chi-square approximations become suspect. It is noted that the tables are sparse and unbalanced. Heuristically, expected cell counts should be four or five or greater with no more than 20% of observed cell counts being less than five. A large number or concentration of zero cells also invalidates the interpretation of the results. With the data as used the number of low-count dubious cells ranged between 63.3% and 81.6%. Another indication of inadequacy is that the minimum expected count is extremely low, often less than one.

Often researchers collapse rows or columns together reducing the degrees of freedom and so increasing cell counts. This was done with the data sets in this research. Values were combined as follows:

-3, -2 } = - 1	-1, 0, +1 } = 0	+2, +3 } = 1

Table 13-1

The idea behind this was that those positive or negative values that were more 'extreme' would be given a value of plus or minus one. Those values of zero or each side of zero would be given a value equal to zero. The resulting tables would be 3 x 3 rather than 7 x 7 and would hopefully contain a greater number of observed and expected counts per cell.

With this amended data, the resulting chi-square test measures remained large and, for the most part, the significance levels remained under .0005 (Appendix K (4)). The exceptions were with *Development* item 5 and *Monitor* item 5 (.005 and .001 respectively) and with *Development* item 3 which rose dramatically to .05. Overall, the significance levels remained at or below 5%. However, cells with an expected cell count under 5 ranged up to 1/3 in certain tables while expected cell counts were still low, never exceeding 8.15. Access to the Exact Tests module within SPSS may have proved useful. This application uses algorithms which permit low or zero expected cell counts in cross tabulation tables.

If one assumes there is some sort of relationship between the two sets of TC variables, both conceptually and statistically, it becomes desirable to measure the strength of that association. Requesting such ordinal probabilistic measures as Kendall's Tau-b and Tau-c, gamma and Somers' d results in measures on a –1 to +1 scale of the association between one variable and the level of the second variable. Negative measures represent negative association while positive measures, of course represent positive association. The extremes measure perfect association while zero implies no association.

The directional ordinal measure from the Somers' d test can be found in Appendix K (2) and K (5), the latter based on the amended 3 x 3 tables. In Appendix K (2), this measure ranges from .23 to .60 indicating a positive relationship which, in some cases (such as *Search* 2, *Monitor* 4, *Problem* 3, and *Opportunism* 1 and 4), is quite strong. In all cases the level of significance did not exceed 0.1% except, as before, with *Development* 3 which had a probability level of 1.1%, still below .05. The Somers' d test results with the amended TC items were similar with one exception (Appendix K (2)). The measures were broader, some higher with others lower, with significance levels usually below .0005. However, *Development* item 3 has a Somers' d measure of approximately .12 with a level of significance of 9.6%, outside of the 5% level usually suggested.

The symmetric measures can be found in Appendix K (3) along with the measures for the amended 3 x 3 tables in Appendix K (6). In the former, these measures range from .15 to .69, the lower measure obtained from *Development* item 3. The tests on this pair of variables also had a level of significance of 1.1% while the rest did not exceed 0.1%. The symmetric measures applied to the 3 x 3 amended tables produced similar results. Again, *Development* item 3 was the exception with measures between .10 and .21 and levels of significance between 8.9% and 9.6%, well outside the 5% level. *Development* item 5 also bore low measures though its level of significance was 2.6%.

The conclusions reached are two-fold. First, the shipper's perception of the various aspects of the cost of transacting with a forwarder versus that with an airline differ significantly. Second, it appears that these two sets of data are positively associated, some pairs of items to a greater degree than others. These conclusions are interrelated in that, while the respondents perceived the two vendors differently, these differences were similar. For example, a respondent may have given a value of –2 to one vendor and –3 to the other resulting in a difference of 1. Another

respondent may have the same difference of 1 but based on values of +3 and +2. In this research the difference in perceptions is paramount.

13.3 T tests

This dependence will be further investigated by examining the differences between each pair of items using t tests. The use of t tests requires three assumptions: that the measures are interval scale; that normal distribution applies; and that the measures' variation is the same within each population (or homogeneity of variance). Because t tests use interval data, the distributions tested are based on the means rather than the frequencies as with chi-square. As mentioned previously, the ordinal data obtained must be considered as continuous data for these tests.

While normality is required, t tests are not much influenced by moderate deviation from normality. The significance tests are particularly strong when the sample size is as large as that in this research (N = 176) and the distribution is the same within each comparison group. With the TC data under analysis fifteen of the twenty two forwarder items were negatively skewed whereas fifteen of the airline items were positively skewed. While normality is assumed – and desired – when performing t tests, moderate departures from normality may not affect the results significantly (Kirk, 1968). Similarly, a moderate lack of homogeneity of variance may not affect significance tests when the sample sizes are the same as with this research, particularly when, as noted below, the Paired Samples t test is used. The standard deviations of the paired samples are similar.

The null hypothesis becomes the assumption that the means of the shippers' perceptions of the costs of transacting with a forwarder and an airline are identical. Any significant deviation from this would void the null hypothesis. The choice of a Paired Samples t test was made as the comparison is between two measures from a single population.

The paired samples correlations (Appendix L (1)) produced positive, substantial, and statistically significant correlation between the two measures. This supports the choice of a Paired Samples t test. The correlation coefficients ranged from .227 (for *Development* item 3) to .692. These coefficients indicate a positive association between the pairs. Scatterplots of the two sets of data will be examined later in this chapter. The Spearman rank correlation coefficient and Kendall's tau-b which evaluate rank association can also be found in Appendix K (3).

The actual t tests are available in Appendix L (2). It should be noted that, because SPSS lists variables in alphabetic order when pairing them, this is the one instance where negative values result. Because all the variable names include the letters 'al' for airline and 'ff' for freight forwarder, the differences are derived from deducting the forwarder scores from the airline scores, not vice versa as with previous analyses. As an example, the variable names for *Search* item 1 were 'srchal1' and 'srchff1' for airline and forwarder respectively. Therefore, negative results here lead to a positive perception of the forwarder in terms of lower transaction costs.

The actual t statistic is invariably negative and large. The level of significance did not exceed .027. Thus it is possible to reject the null hypothesis and suggest that the means of the shippers' perceptions of the costs of transacting with the forwarder and the airline differ significantly. In addition, both ends of the 95% confidence interval of the difference are negative for all pairs. This implies that if one were to repeatedly perform these tests, on average, the true mean of the population would be included within these bands 95% of the time. Because these bands are negative only and do not contain zero they indicate significant differences in the two groups.

While normality is not as relevant with sample sizes over 25 both Normal Q-Q plots and detrended Normal Q-Q plots were created. The pattern of

circles with the former corresponded closely to the reference line which would usually indicate that the data were fairly normal. However, the Kolmogorov-Smirov test (Lilliefors Significance Correction) indicated otherwise. The significance values obtained – all less than .0005 – would suggest that the sample was not normal. The detrended normal plots showed major deviations from the normal throughout the distribution though it is most obvious in the tails of the distribution (Appendix L (3)).

Error bar charts visually depict the results of the analysis of the transaction cost differences. The mean of the sample group is represented by the small red square in the middle of the error bar. The bars or 'whiskers' represent the upper and lower limits for the 95% confidence band. Rather than present these error bar charts on an item by item basis, Appendix L (4) contains error bar charts based on the summed meta-variable for each of the five TC aspects. It should be noted that, except for *Opportunism* (which still doesn't overlap), the lower limit for the forwarder does not remotely approach the upper limit for the airline. This would suggest that at the 95% level of confidence the differences between the shippers' perceptions of the costs of transacting with a forwarder and an airline in this sample are significant.

13.4 Scatterplots

Scatterplots visually indicate the association between each pair of items. By matching the forwarder and airline values for each respondent as a point on an X-Y plot and adding a 'best fit line' one can see how this association looks and where deviations occur. Multiple points can be combined using sunflowers. Scatterplots were created for the summed meta-variables for each of the five aspects of transaction costs as well as an additional plot for *Problem* items less Item 1 (Appendix M). A 45° line was fixed on the plot alongside which to compare the best fit line. The

best fit line was based on the quadratic option offered by SPSS. Various options were tried and the quadratic fit method best represented the data.

An interesting pattern developed. For most of the plots if the respondent perceived the airline in a positive way (i.e., with a sum total of that TC aspect over zero) then he perceived the forwarder similarly. This can be noted in the upper right quadrant of the plots where the best fit line is virtually superimposed on the 45° line. In other words, if the respondent considered the airline positively in terms of the costs of transacting then he would consider the forwarder in the same way: the difference would be negligible. However, if the respondent perceived the airline negatively (i.e., with a sum total of that TC aspect below zero) then he perceived the forwarder either positively or slightly negatively. This can be noted in the upper and lower left quadrants of the plots. When it comes to the costs of transacting with an airline, it appears that if the respondent considers that vendor negatively he may consider the forwarder positively or much less negatively. In this case, the differences are greater and in the forwarder's favour. It is possible that the majority of the statistical difference obtained between the shippers' perceptions of the costs of transacting with forwarders and with airlines is derived from those respondents who negatively view the airline.

13.5 Non-parametric tests

Finally, non-parametric tests were carried out on the TC data, partly to verify the parametric tests on the differences carried out previously. The actual rankings can be found in Appendix N (1). Note that positive ranks apply to those pairs that show a positive difference when airline scores are deducted from forwarder scores. In this case, therefore, the respondent perceives the forwarder as having a lower cost of transaction for that item and, consequently, offering higher value. Obviously then, negative ranks apply to those pairs that evince a negative difference (i.e., the respondent

has scored the airline higher than the forwarder and perceives the former as having lower TCs for that item). Except for only a few items, the significance level with the test statistics (based on Wilcoxon Signed Ranks test and the Sign test) is below .0005 (Appendix N (2)). Overall, no statistic has a level over 5%. This suggests that there is a significant difference between the shippers' perceptions of the costs of transacting with the forwarder and the airline and that this difference lies in the forwarder's favour in terms of lower transaction costs. These non-parametric tests agree with the parametric tests done earlier.

13.6 Demographic variables

Does the shipper's make-up affect his perception of the costs of transacting with the forwarder and the airline? Or, to be more accurate, do the sample's demographic variables influence the differences between the shippers' perception of the costs of transacting with forwarder and those with the airline? ANOVA tests measure the extent to which variation within a group is smaller than the variation between groups using the groups' sizes and means. This procedure was used with each demographic variable by comparing the groups with the respondents' perceptions of the various aspects of transaction costs (Appendix O). As some percentage-based variables consisted of continuous data, they were partitioned into bands and the resultant ordinal measures were used. These measures would be: 1 (0% to 20%), 2 (21% to 40%), 3 (41% to 60%), 4 (61% to 80%) and 5 (81% to 100%). Tests of homogeneity of variances varied. The significance level was usually above 5% which would suggest the null hypothesis assuming homogeneity of within group variance be accepted. For those tests with significance levels below 5% the null hypothesis must be rejected suggesting the sample sizes are disparate and the tests may not be robust.

In addition, several non-parametric tests (Kruskal-Wallis and Median tests) were carried out on some of the variables. They verified what was found with the ANOVA tests. In general, the results indicated these demographic factors had little effect on the respondents' perceptions of the costs of transacting with the two vendors.

Question 1: Size in terms of shipments exported world-wide

With F statistics small – in most cases under one – and levels of significance in excess of .05 the null hypothesis must be accepted. An F statistic under the value of one suggests that the variance between groups is less than that within groups. Thus, there appears to be no significant differences in these groups as presumed by the null hypothesis. Size, with this sample, in terms of the number of shipments exported globally, plays little part in the shipper's perception of transaction costs.

Question 2: Contribution of exporting to corporate revenue

The percentage measure was split into five bands as described above. Again, the ANOVA tests indicated little significance to differences by group between the summed TC differences. The null hypothesis – that shippers, when grouped according to the contribution of exporting to their revenue stream – perceive the TC differences between forwarders and airlines similarly – could not be rejected. Relative importance of exporting to a shipper (measured as a percentage of their revenue) appears not to be a factor in how they perceive the TC difference between a forwarder and an airline.

Question 3: Trading regions to which goods exported

Similarly, the trading regions to which the respondents in this sample exported their goods were not a factor in shippers' perceptions of the differences in the costs of transacting with a forwarder or an airline.

Question 4: Number of consignees in major trading region

Again, the number of consignees a shipper might have in his most important trading region was not a factor in the difference in how he might perceive the cost of transacting with a forwarder and an airline.

Question 5: Dominant transportation mode used and the percentage use of ocean freight

The transportation modes provided in the survey to shippers for exports outside of Europe consisted of air, ocean, road, rail, and any other they might have mentioned. The dominance of one mode over another – especially the exposure to ocean freight – did not affect the perceptions of the shippers in this sample of the differences between the costs of transacting with forwarders and airlines.

Question 6: Use of airlines and percentage use of forwarders

Originally, the dependent value was to have been derived from the first part of this question. Used as a dichotomous measure (any use of airlines? yes or no) in the ANOVA tests there was a somewhat interesting result. At the 5% level of significance the null hypothesis of no differences in variation between groups for this factor would be accepted. However, at the 10% level one might reject this null hypothesis and suggest that there are differences between users and non-users of airlines in their perception of the difference in the transaction costs of developing a relationship with a

chosen vendor. The level of significance was 9.6% for this TC aspect when factored against the use or non-use of airlines. In addition, the cost of searching was just outside this arbitrary significance level of 10% (10.1%).

Statistically, the transaction cost of searching was significantly affected by the use of forwarders. With a level of significance level of 4.9% - under the usual 5% for this research – the mean square variance between groups was greater than that within groups (F = 2.442). This suggests that the degree of shippers' usage of forwarders might affect their perception of the costs of searching for a vendor. Post hoc tests were run on this dependent/factor pairing to draw out where the differences, if any, lay. The post hoc tests run included LSD (Least Significant Difference: a liberal test), REGWF (Ryan-Eniot-Gabriel-Welsh F: a midrange test), Scheffe (a conservative test), and, as homogeneity of variance is low, Games-Howell (Appendix P (1)). The liberal LSD results indicated that there were significant differences between those shippers who indicated they used forwarders 41% to 60% of the time. The REGW test confirmed that the 41% to 60% group did differ from the other groupings except for the 61% to 80% group. However, this result was not matched by the other tests. While possibly statistically significant it is not 'conceptually significant' in that there is no conceptual reason for that particular grouping of forwarder-using shippers to be different from other shippers who use forwarders more or less of the time.

Question 8: Percentage of airfreight transported by dominant carrier

The amount of freight carried by a single air carrier to the shipper's most important trading region was not a significant factor affecting the various TC aspects of using a forwarder or airline.

Questions 9 and 10: Numbers of forwarders and airlines with which the shipper deals

For all aspects of the costs of transacting with forwarders and airlines other than *monitoring*, the numbers of vendors with which the shipper might deal was not a significant factor. *Monitoring* was affected by the number of forwarders used by the shipper to a significant level (2.7%). As for the transaction cost of searching and the percentage use of forwarders (Question 6) post hoc tests were carried out (Appendix P (2)). This time all the tests, other than the conservative Scheffe test, agreed that there was a significant difference between those shippers who used one forwarder and those who used three to five forwarders when it came to the perceived transaction costs of monitoring the performance of their chosen vendor(s). There is conceptual gratification but also a problem with this. It would be anticipated that those shippers who use more than one forwarder (or airline) might perceive the costs of monitoring all of them to be higher than those which use – and monitor – only one vendor. However, if that is so, it would be expected that such a significant difference would also appear between the users of one forwarder and those who use more than five forwarders. The liberal LSD test had a significance level of 5.3% for the difference in perceptions of monitoring TCs of those shippers who use one forwarder and those who use over five. But no other test showed a significance level less than 20%. Therefore, it is not possible to conceptually reject the null hypothesis that the groups are similar in their variance.

Question 11: Corporate experience of exporting

Experience of exporting and dealing with forwarders and carriers in both air and ocean transport modes was not a factor that affected the differences between the shippers' perceptions of the costs of transacting with forwarders and airlines.

Question 12: Use of trading terms

What effect, if any, does the shipper's use of the various trading terms (INCOterms) have on his perception of the TC difference between the forwarder and airline? Of all the permutations of TC difference and use of trading term only one showed a significance result. Once again, *Monitoring* was affected by a demographic factor, this time the importance of D-type terms (significance level of 1.3%). Such terms are commonly used by exporters who wish to control virtually the entire movement of the goods to the consignee's door. DDP (delivered duty paid) even includes the foreign customs clearance and applicable duties and taxes.

Post hoc tests were contradictory. The LSD test and the Ryan-Einot-Gabriel-Welsch F test considered those shippers who ranked D-type terms third considerably different from all other shippers in terms of their perceptions of the difference in monitoring costs between forwarders and airlines. The Games-Howell test suggested those same shippers who ranked D-terms third in importance only differed from those on each side of them who ranked D-terms second and fourth. The Scheffe test only showed a significant result between those who ranked D-terms third and those who ranked them fourth.

However, it would have been conceptually more relevant if the significant difference had been between those who ranked D-terms first and those who didn't use these terms at all. Such a difference was hoped for as those who might want to control their global supply chains (and consequently use D-type terms) may also wish to deal directly with the carrier and maintain control of all aspects of transportation. Statistically significant differences between shippers who rank D-type terms third and any other shipper is not particularly relevant.

13.7 Summary

This chapter presented analyses of the shippers' perceived costs of transacting with the airline and forwarder by matching the pairs and examining the differences. The tests used were for categorical (crosstabs) and continuous (t tests) data. In addition, non-parametric tests were carried out. In virtually all cases, the tests indicated a significant difference in the respondents' perceptions of these costs. These transaction cost analyses were then followed by an examination of the demographic variables and their impact on the respondents' TC perceptions.

In terms of the demographic variables, the shipper-respondents in this sample, though predominantly users of airfreight forwarders almost to the exclusion of airlines (approximately 90% use forwarders only), appear to be typical of global airfreight shippers in Britain. There was good representation from all size groups, degree of corporate experience, exposure to various transport modes, and usage of the various trading terms. Deriving the sample from the customer database of a large British freight forwarder may have ensured such a good cross section. While technically inappropriate to infer some of the preceding results to the general population, these findings suggest that British shippers who use airfreight forwarders to export to trading regions outside of Europe perceive the forwarder to offer a lower cost of transaction than the airline. This perception was not affected by many of the demographic factors examined, including the use of airlines. Those shippers that did use airlines to any degree also perceived these differences similarly to those shippers who did not use an airline at all.

13.8 Statistical conclusions

The preceding five chapters covered the quantitative phase of the research. Within these chapters were found the description and

application of and the rationale for transaction cost analysis; details of the research method used; and the analyses and results obtained. The objective of this TCA phase was three-fold:

1 to compare the shipper-respondents' perceptions of the costs of transacting with the airfreight forwarder and airlines,

2 to elicit their perceptions of production cost (price) advantages, and,

3 to explore their demographics in order to discover patterns in their TC perceptions.

The acquisition of the transaction cost and production cost advantage data as well as the statistical tests available does not appear to allow a measure of the proportional contribution each facet of TCT provides to the final mathematical model. Respondents perceived the forwarder to offer lower transaction costs over all facets while also offering greater production cost benefits which may translate into price advantages. If the respondents in this sample had valued the airline over the forwarder when it came, for example, to transaction costs it might have been safe to conclude the production cost advantages of the forwarder overcame these transaction cost deficiencies. However, in general, the forwarder had both a transaction cost and a production cost/price advantage over the airline.

In the TC sections the respondents' answers to the forwarder and airline questions were directly, positively, and often strongly related. However, the difference between these answers was distinct. In general, for all 22 pairs of items, shippers in this sample perceived the forwarder as offering a lower cost of transaction than the airline. As these shippers were predominantly users of forwarders, this might be expected. The positive relationship between the forwarder and airline scores would suggest that the respondents compared, consciously or not, the scores given to each vendor when completing the survey. An interesting relationship appeared when examining a best fit line in scatterplots matching the forwarder summed meta-variable scores against those for the airline. These

scatterplots would suggest that those respondents who perceived the airline positively did not differ very much in their similar perception of the forwarder. Thus, the difference in scores would be negligible. However, those respondents who considered the airline negatively in terms of transaction costs, did not score the forwarder similarly. They often valued the forwarder positively or far less negatively. The result would be a large difference in scores in the forwarder's favour.

Scores for the production cost/price advantages all favoured the forwarder. This would suggest the respondents in this sample considered the forwarder as having the production cost – and presumably, price advantage – over the airline. With both a transaction cost and production cost advantage over the airline it would be unlikely to discover any major direct use of airlines in this sample.

Except for a few instances, the demographic variables seemed to play little part in the degree of forwarder-airline TC difference. The transaction cost of monitoring three to five forwarders was different than the cost of monitoring only one forwarder. However, this difference was not significant for those respondents who monitored over five forwarders. In general, any differences in transaction costs in this sample based on the demographic variables were not significant.

Chapter 14: VALIDATION, RELIABILITY, AND RIGOUR

14.1 Introduction

Rigour in research is expected, whether the methods employed be qualitative or quantitative. How can the quality of a piece of research be assessed? By quality, researchers mean the validity, reliability, and generalisability of the work. This chapter will look at these items and apply the concept of rigour to the qualitative and quantitative work carried out in this research.

In his unpublished thesis, Ross matches the usual concepts of rigour in a positivist sense to those concepts inherent in qualitative research (Ross, 1996). Throughout the following chapter this classification will be used to examine the application of these concepts to both the qualitative and quantitative work done in this research.

14.2 Validity

Validity takes on many forms and many names, especially when used in the different contexts of qualitative and quantitative research. In general, qualitative researchers would ask if the researcher had gained full access to the knowledge and meanings of his informants while their quantitative counterparts would ask if the instrument used measured what it was supposed to measure (Easterby-Smith, Thorpe, & Lowe, 1991). Lincoln and Guba suggested qualitative validity would consist of rich descriptions, triangulation of sources and methods, and peer and participant review (Lincoln & Guba, 1985). One suggestion to improve qualitative validity – inter-rater reliability in which multiple raters code the data – is generally not applicable to individual PhD research.

Validity issues can be split between those relating a priori to the final iteration of the instrument – qualitative or quantitative – and those that arise during the analyses. Many aspects of construct and internal validity occur early on in the research timeline while others such as criterion, external, and statistical conclusion validity appear later.

Questions about internal validity ask to what degree do the findings correctly explain the phenomenon in question. Is the relationship between variables in quantitative research causal? And is this relationship plausibly as well as statistically significant? When dealing with qualitative research, is the work credible or trustworthy? Internal validity can be affected by the instrument itself or the selection of the sample as well as changes that may occur over the duration of the research. Credibility in qualitative work is derived from prolonged engagement of the respondents, adequate reference to prior work, comprehensive or 'thick' description, respondent feedback and input, and maintenance of a research diary or similar reflective journal (Ross, 1996).

With this research credibility was established early on with the semi-structured interview questions grounded in the literature and feedback provided to and input received from the respondents. The use of NUD*IST offers the qualitative researcher the option of keeping a diary of ideas about the research (Kelle & Laurie, 1995). Such a journal was used to demonstrate changes in concepts derived from the data. As a precursor of validity, transcription quality was developed through pre and post-interview reviews (Poland, 1995). The use of multiple qualitative formats – textual, graphical, and tabular – for the analysis and the feedback built up the description of the triadic relationship. These various formats and their juxtaposition with the quantitative work carried out subsequently become a form of triangulation which also increases internal validity.

Because the quantitative work was based on an instrument generated within previous experimental research (Pilling, Crosby, & Jackson, 1994) as well as on Transaction Cost Theory, a relationship between the variables was already established. A realistic approach as used in this research presupposes that if the derived model correctly represents the underlying mechanisms and structures then the phenomenon under question would be causally explained. The concept of causally relating variables is moot because these causal relations are conceived only as tendencies which may or may not produce observable events (Outhwaite, 1987).

Construct validity asks if the measures used assess what they intend to assess. What are the constructs in an instrument and how well do they measure the intended concepts? One aspect of construct validity is nomological or substantive validity. One should define the theoretical meanings for the researchers and respondents in terms of everyday language (Angleitner, John, & Lohr, 1986). In the qualitative phase of the research this was done both by pre-testing the interview schedule with several industry colleagues and by defining and agreeing on the terms used during the interviews. The survey instrument in the quantitative phase contained definitions of any non-industry terms and was written in language used by the respondents.

Another aspect of construct validity is content validity. This begins with face validity which is simply a cursory review of the items by non-experts (Markoczy, 1996). This was provided by academic colleagues. Content validity is a subjective measure of the appropriateness of the items to a set of reviewers who have knowledge of the subject. Pre-tests of the interview schedule and the survey instrument were carried out: the former with industry colleagues and the latter with some of the respondents from the first qualitative phase. The instruments from both phases were pre-tested with academic colleagues.

Construct validity can also be broken down into two components: convergent validity and discriminant or divergent validity (Mentzer & Kahn, 1995; Mentzer & Flint, 1997; O'Leary-Kelly & Vokurka, 1998). The former relates to the degree to which several methods of measuring a variable or manipulating a construct provide the same result. Discriminant or divergent validity is the degree of distinction of separate concepts. O'Leary-Kelly and Vokurka suggested a three part method to research to ensure high construct validity. First, the researcher should identify a series of measurement items which he believes will measure the construct. These empirical indicators should connect logically and theoretically to the construct. Second, he should determine the extent to which these indicators measure the construct. For this, the researcher should examine unidimensionality and convergent validity (usually through factor analyses)and measure reliability (Cronbach's (alpha) coefficient). Third, the researcher should measure the degree to which one concept relates to other concepts.

For this research, two methodologies – qualitative and quantitative – as well as several statistical tests were used to measure variables and manipulate constructs. The results were similar in most cases. Factor analyses (Principal Components analysis and Principal Axis Factoring) and reliability testing (Cronbach's (alpha) coefficient) were carried out to test for convergence/divergence as well as unidimensionality.

Criterion validity is an indicator of how well the instrument measures up against another instrument (Churchill, 1979; Markoczy, 1996; Nielson, 1996). Again, there are two components. Concurrent validity looks at the present. How does this instrument compare to the ultimate test of a variable? Predictive validity looks, of course, at the future. How well does this instrument foresee future events?

The instrument used in the quantitative phase was derived from one created from a carefully controlled experiment. This instrument would thus appear to be well designed. Adaptations were made to the original instrument to provide the conceptual information needed. This may have reduced its concurrent validity. Explanation, not prediction, is the objective of a realist approach. This consists of creating a model that explains the underlying mechanisms which may cause events.

External validity is the degree to which the findings from the research can be generalised to other similar settings, people, or time. In quantitative work, generalisability suggests the degree of applicability of the results to the population from which the sample was drawn (Easterby-Smith, Thorpe, & Lowe, 1991; Bryman, 1993; Mentzer & Flint, 1997). Ross separates generalisation and external validity when applied to qualitative research (Ross, 1996). Some academic writers in the qualitative field suggest the qualitative equivalent of external validity is transferability (Guba & Lincoln, 1994). To Ross, external validity may imply generalisation but applicability, as a parallel notion, equates to purposeful sampling. In that case, the reader becomes responsible for transferring the propositions to another setting.

It is difficult to assess the degree to which the qualitative work can be 'transferred' to another place or time. Likely, the application to forwarders, carriers, and shippers in similar English-speaking settings could be envisioned. In some ways, corporate culture in the forwarding industry appears stronger than national culture. Forwarding is very much a global business. The ability to transfer some of the results derived from the qualitative phase to other industrial settings is more difficult. While service intermediaries may face some of the same problems and even work with some of the same suppliers (i.e., travel agents and passenger airlines), modal differences in global freight transportation make the forwarder-carrier-shipper triad unique.

Inferential statements that transfer findings from the sample to the wider population are based on statistical theory. Was the sample 'random' enough? Could errors have been made in rejecting the null hypotheses? The levels of significance used in the quantitative phase of this research were, for the most part, very low (on the order of .0005) which would appear to increase the certainty of correctly rejecting the null hypothesis. and accepting the alternate hypothesis.

However, the sampling method could be suspect. With non-probability sampling methods statistical inference from sample to population cannot be relied upon. Quota sampling, as used in the quantitative phase, may be acceptable. To be justified, the quotas should accurately reflect the target population and selection bias should be minimal. The quotas used (British exporter, outside of Europe, user of airfreight) were commensurate with the research concepts. Selection bias was hopefully avoided by first using the client database of probably the largest airfreight forwarder in Britain. This should have ensured a good cross-section of British, global, airfreight exporters who use forwarders. Second, *all* these clients were targeted; those that did not meet the quota description would eliminate themselves. Third, the net response rate at 21.2% was expected and adequate for this research.

While technically inappropriate to infer the results from the quantitative phase to the general population, these findings suggest that British, global, airfreight shippers would perceive the costs of transacting with forwarders and airlines in a similar way to the respondents in this sample.

14.3 Reliability

For both qualitative and quantitative researchers, reliability has a similar meanings. The question quantitative researchers must ask themselves is

if the measure will yield the same results on other occasions? Qualitative researchers would ask if similar observations would be made by different researchers on different occasions (Easterby-Smith, Thorpe, & Lowe, 1991)? Replication or reproduction by another researcher are at the core of reliability. To writers about qualitative research, reliability in the positivist sphere can equate to dependability (Guba & Lincoln, 1994; Ross, 1996). How dependable is the research and the data and will other researchers appreciate and understand how the results were obtained? Ross suggests that instead of a reliance on repeating results and inter-rater reliability, there should be a stress in qualitative research on credibility and confirmability based on accessible audit trails and reflexive journals (Ross, 1996).

In the qualitative phase of this research NUD*IST provides both 'storage' for such a reflexive journal as well as an automatic audit trail of changes in the analysis (Richards & Richards, 1994a, 1994b; Kelle & Laurie, 1995). While a Phd. thesis is a solitary affair, the researcher must consider if others will understand his path and acknowledge how the conclusions were reached. Respondent feedback and peer review are crucial to this.

A common practice to increase reliability in survey settings is to use multiple items for each construct. Data reliability can be measured through Cronbach's alpha test and factor analyses. In this research, both tests were used to measure internal consistency of the items.

There may be a chasm between validity and reliability, especially in qualitative work. Mason has suggested research based on structured surveys over-values reliability at the expense of validity (Mason, 1996). He says:

> '...most qualitative researchers see the very fluidity and flexibility of methods such as semi-structured interviewing as enhancing validity, and criticise the rigidity and standardisation of structured

> questionnaires by contrast for lack of sensitivity to validity in favour of an excessive concern with reliability and ease of qualification in analysis' (p. 148).

Conversely, Kirk and Miller suggest that qualitative research has gained validity at the expense of reliability in the data collection phase (Kirk & Miller, 1986). It may be difficult to resolve this balance in a work involving both qualitative and quantitative research.

14.4 Objectivity

The dilemma between etic (outsider) and emic (insider) is at the core of the debate between those who use quantitative or qualitative methods. Quantitative researchers wish to exclude any bias from their work and remain outside of and objective regarding their data. As several writers have suggested, qualitative researchers seek confirmability instead of objectivity (Guba & Lincoln, 1994; Ross, 1996). In this context, confirmability does not mean replication and substantiation but corroboration and authentication by peers and interviewees.

The use of multiple methods as in this work allows the researcher to wear both subjective and objective hats. Subjectivity is almost impossible to ignore in qualitative research, especially with a background in the industry. Objectivity in the quantitative phase requires findings free from bias. While subjectivity is necessary in the qualitative phase, it can be restricted to the acquisition of data with a neutral stance taken to whatever findings may emerge.

14.5 Validity issues

Any validity issues can be examined over three facets of the research: the method(s) chosen, the sample(s) selected, and the data acquired. With

this research the methods fall into two areas: qualitative research based on semi-structured interviews and quantitative research based on survey. The two methods work well together in terms of triangulation and contribution to each other. Liabilities with one method may well be ameliorated by the other. The interview phase offered a broad picture of the triad of shipper, carrier, and forwarder looking at value contribution. The survey phase narrowed that down to those users and providers of airfreight services and concentrated on value contribution through (transaction) cost reduction.

There were possible validity issues arising with the sample. The respondents in the qualitative phase were split between carriers (air and ocean), forwarders, and shippers. This included individuals well acquainted with each other's business, whether from prior employment in it or from executive positions in industry associations. However, the sample obtained for the quantitative phase was affected by the overwhelming control forwarders have of the global airfreight business. This propensity towards the forwarder (approximately 90% of the respondents never use an airline) may be characteristic of airfreight shippers in general. An attempt to balance this sample against that derived from the (non-forwarder) client database of a large global airline failed. This is not to say such a sample would tilt towards a greater use of the airline. From knowledge gleaned from airlines' publicity, advertising, and industry sources, it is believed non-forwarder users of airlines may not use the airline for the majority of their shipping. However, such users may perceive the costs of transacting with airlines as being relatively less in comparison to the costs of transacting with forwarders.

The data actually obtained in both phases of the research was satisfactory. That from the qualitative phase proved interesting and rewarding – some comments were extremely useful. The quantitative

data, especially that from the transaction cost and production cost advantage (sic) items, was good and adequately distributed.

14.6 Conclusion

There is a compromise with validity and reliability in multiple method research. Often, what might appear invalid or unreliable based on one method is satisfactory with the other. Qualitative research insists upon similar ideals to quantitative work but these ideals are not reached through statistical means. Those who carry out qualitative work seek peer review, corroboration, and credibility to verify their work. In simple terms, quantitative researchers seek measurements within a certain statistically predictable range on a repetitive basis. Qualitative researchers invite appreciation – not necessarily agreement – for the method used, data obtained, and analysis carried out.

Chapter 15: CONTRIBUTION

15.1 Introduction

What contribution has been made in the preceding fourteen chapters? And to whom or what has this contribution been made? Academic contribution should involve theory, whether it is the creation, testing, or extension of it. This contribution to knowledge can embrace methodology by offering researchers another way to look at a problem. Contributions can also be made to the substantive area in commercial applications. The following chapter looks at the conclusions and contributions made by this research in the areas of theory, methodology and substantive application.

15.2 Contribution to theory

From a positivist's point of view, building theory involves the identification of constructs, the specification of the relationships amongst these constructs through operationalisation, and the testing of these relationships, often through attempted falsification (Doty & Glick, 1994). On their own, variables, diagrams, and hypotheses are not theory (Amundson, 1998). Theory comes from the interrelation of these concepts with the purpose of explaining and/or predicting the phenomena under study (Kerlinger, 1986). Wacker suggests good theory building comes from defining the variables, specifying the domain, eliciting relationships amongst the variables, and making predictions (Wacker, 1998).

Transferring the concept of theory construction to a qualitative setting, suggests good theory in qualitative research lies in the exploration and linking of theoretical and explanatory concepts (Richards & Richards, 1994a). The building up of a hierarchical network of such linkages can represent the emerging theory (Prein, Kelle, Richards & Richards, 1995). Gioia and Pitre suggest generating descriptions, insights, and explanations

in order to reveal a system of meaning and structure is the goal of qualitative theory building (Gioia & Pitre, 1990).

When it comes to theory building, what promoters of qualitative and quantitative research have in common is the desire to seek plausible relationships amongst concepts and to possibly remove this set of relationships one step beyond the phenomenon it attempts to explain.

Under the realist banner, theory creation or building involves the construction of hypothetical models which may uncover the real structures and mechanisms which are assumed to produce the phenomena under question. What are the structures and mechanisms that co-exist with the phenomena of service intermediation in global logistics? What gives rise to freight forwarding? The phenomena of the inter-relationships amongst carrier, shipper, and intermediary were observed in the semi-structured interviewing phase. These perceived regularities were, amongst others, the descriptions, degree of usage, appreciation, and knowledge of each other. Cost and price were interwoven throughout.

Drawing upon TCT, it was postulated that buyers' perceptions of the costs of transacting with intermediaries and ultimate global air freight suppliers lead them to decide between a market approach (using the intermediary) or a hierarchical approach (internalising the intermediary function and dealing directly with the ultimate supplier). The phenomenon of the existence of the intermediary in the supply chain could be causally explained by a model based on TCT. If a buyer perceives the (transaction) cost of using an intermediary to be relatively high he will internalise the intermediating function and deal directly with the primary supplier; conversely, if the buyer perceives the cost of using an intermediary to be relatively low he will go to the market and use an intermediary – all else being equal.

The initial semi-structured interview phase brought out both the observed phenomena previously propounded and explanations for them. Buyers of global logistics airfreight (shippers) were surveyed as to their perceptions of the costs of transacting with intermediaries (freight forwarders) and directly with the airlines. These perceptions (measured on a 7 point Likert scale) were compared and the differences were found to be significant. These differences all lay in favour of the forwarder; the respondents in this sample perceived the forwarder to offer a lower cost of transaction. The respondents also perceived the forwarder as holding the price or production cost advantage over the airline. Under TCT, such results were expected as most of the shipper-respondents primarily used the forwarder.

The results from the quantitative phase were a validation of the TCT concept. The shippers in this sample had outsourced the intermediary function to the freight forwarder. Rarely was this intermediary function kept in-house and the airline used directly. From a pragmatic viewpoint, under TCT one would expect these shippers to perceive the combination of transaction costs and production cost (dis)advantages to be lower for the forwarder than for the airline. Globerman and Schwindt used a similar rationale, albeit without the comprehensive statistical analysis of this research (Goberman and Schwindt, 1986).

The results from the survey instrument used were triangulated with the semi-structured interview results obtained earlier. The opportunity exists to repeat this model-building process with other transport modes (sea, truck), with other intermediating industries (travel agents) or with major supply chain effects (e-commerce and disintermediation)

This research contributes to theory by extending Transaction Cost Theory to encompass intermediaries, in this case service intermediaries, as a means of reducing the *total* transaction and production costs to the buyer. In TCT terms, the function that is being out-sourced (or kept in-house) is

the service of intermediation. The knowledge-based components that make up service intermediation are supplier search and relationship development and maintenance. This is in addition to any available price advantages but excludes the usual product intermediary's provision of immediacy as services cannot be stored (Palmer, 1994; Schmitz, 2000).

While transaction cost benefits may often lie with the intermediary relative to the primary vendors, possible production cost advantages accrue to the buyer often at the expense of these vendors. Nominally, the service intermediary's production cost advantages lie with economies of scale. This brings financial benefits either through commissions (i.e., travel agents and IATA commissions paid to forwarders) or through consolidation or groupage.

This ability to view transaction cost theory on a triadic basis rather than a dyadic exchange relationship could benefit future SCM research. A primary theoretical result of this research has been the setting up of the basic building blocks for a theory of service intermediation. Intermediaries in a supply chain – especially where the purchaser is not removed from the primary vendor – point to some sort of triadic relationship in which the buyer, seller, and intermediary co-exist. This non-linear amendment to the oft-described straight supply chain 'path' could help future research into supply chain relationships.

As also pursued by Ellram, this aforementioned contribution to management theory comes from integrating supply chain concepts into organisational and transaction cost theories. Organisation theory attempts to explain the nature of organisations, their development, and their functions (Aertsen, 1993). To apply supply chain concepts to this one needs to consider multiple organisations and their relationships in the context of a singular organisation theory. Transaction cost theory acknowledges this by focusing on the boundary of the firm and, therefore,

includes the environment outside of the firm. Functions, in the context of TCT, can be performed within the organisation or outside of its boundaries. The firms performing these outsourced functions become nodes in the firm's accepted 'supply chain'.

Finally, marketing theory has recently been directed towards relational exchange (Dahlstrom, McNeilly, & Speh, 1996). It is hoped this research can provide some insights into relationship theory and help operationalise future work in this area.

Therefore, at the theoretical level, this research has contributed to transaction cost theory through its inclusion of intermediaries and supply chain concepts, supply chain management through the incorporation of the triadic relationship, and marketing theory by submitting operationalisation of relational concepts based on transaction cost theory.

15.3 Substantive justification

At the commercial level, this research has explained the intermediary position of the forwarder vis-à-vis the carrier. Why the freight forwarder exists and may continue to exist can be explained through the contribution of value to the shipper. The forwarder offers value by reducing the shipper's *total* costs. These costs comprise the costs of transaction as well as price advantages the forwarder may offer for the primary transportation service. The quantitative phase of the research suggested shippers who predominantly use forwarders perceive the costs of transacting with them to be lower than the costs of transacting directly with airlines.

The price advantages (when available) held by freight forwarders over carriers are usually based on economies of scale. These price advantages are often derived from buying the primary vendor's services 'in

bulk' and retailing them to the purchaser at a proportionately lower price than he would obtain directly. In the case of freight forwarders these bulk purchases and subsequent sale are called consolidation or groupage. Unlike other service intermediaries (such as 'pure' travel agents for whom carrier-derived commissions constitute the biggest – and sometimes only - source of revenue), the freight forwarder earns revenue from consolidation, commissions, and charges for extra services such as document preparation and drayage.

When compared to the airline, the research indicated that the freight forwarder was perceived by shippers as offering lower costs of transaction and holding production cost advantages that could result in a lower price. Certain shipper demographic variables such as size, experience, and numbers of vendors were conjectured to affect this perception. However, with this sample, for the most part, these demographic variables insignificantly affected the difference in perceived transaction costs between forwarder and airline.

Aside from its contribution to the quantitative phase, the qualitative phase of the research brought out the factors that affect the relationship between the carrier and the forwarder and the relative triadic centrality enjoyed by the forwarder at the expense of the airline. The historic and economic reasons for this were discussed.

A major finding in the qualitative phase was the modal difference in the triadic relationship. Ocean carriers were much more central than airlines, often dealing directly with shippers, especially those shippers who conveyed goods FCL. Because airlines were historically more focused on passenger transportation, moving freight became a poor second cousin to moving people. The retailing of airfreight was outsourced to the freight forwarder who had, until the advent of airfreight, concentrated on ocean freight but embraced this new mode quickly. The accession of the

integrator brought the airline and forwarder closer together to compete with this common enemy. Thus, to the airline, the forwarder was a customer – because of his purchase of space; a collaborator – because of the integrator; and a competitor – because the airline now wanted to disintermediate the forwarder. Without a common competitor like the integrator and with a trend towards ocean carrier derived 3PL firms, the relationships between forwarder and ocean carrier are those of customer and competitor only.

15.4 Contribution to methodology

Transaction cost analysis (TCA) is the application of transaction cost theory. Over the decades TCA and TCT have been refined and amended. One major aspect of this has been the rejection of the prescriptive 'make or buy' decision as the only alternatives available. In much of the 1980s, research grounded in TCT accepted only the two extremes of carrying out the function in-house ('make') and outsourcing to the market ('buy'). These were known as hierarchical and market governance.

Williamson later amended the concept of governance structure to include other hybrid forms between hierarchical and market (Williamson, 1991). During the 1990s many writers explored vertical integration in terms of a continuum of governance choices (Ellram, 1991; Cavinato, 1992; Mahoney, 1992; Bakkeland & Pitt, 1994; Bello, Dant, & Lohtia, 1997). This continuum contained such alternative governance structures as equity interest, joint ventures, franchising, and long and short-term contracts between the extremes of full acquisition and transaction on the spot market.

This research might provide an additional alternative to these governance structures. While outsourcing to an intermediary can usually be associated with a contractual or transactional governance structure, it

does provide another way of examining organisational relationships. In some cases, both intermediary and primary supplier will be used by the purchaser making a simple governance description overly complicated. Intermediation is a viable alternative to the various relationships in the continuum of governance structures.

The method used in the second phase was based on an instrument derived from an experiment carried out by Pilling, Crosby, and Jackson (1994). By duplicating the items across to a second vendor, it allowed the respondents to compare the costs of transaction between this vendor and the first. This comparison of *perceived* transaction costs could offer researchers – both academic and commercial – a method of comparing existing exchange relationships with potential ones, including bypassing the present relationship. As a potential relationship could be a null relationship, this could be a possible first step towards disintermediation and contraction of the supply chain.

An additional contribution to method involves the difficulty researchers have with operationalising internalisation in TCA studies. With intermediaries, such difficulties no longer arise. The degree to which the firm (in most cases, the purchaser) has internalised the intermediary function is commensurate with the degree of use of the primary supplier. In the case of airfreight forwarding, if the shipper uses the airline for 25% of his shipments (where a shipment represents a single transaction) he has internalised 25% of the intermediary function. Such a surrogate for internalisation is readily available when intermediation is the governance structure being researched.

15.5 Summary

In conclusion, contributions have been made to theory, the substantive area, and to method. Transaction cost theory can accept intermediation

as an alternative governance structure by including intermediation as a potentially outsourced function. Theories that revolve around supply chain management can consider the triadic relational form.

Commercial research has benefited from a greater knowledge of the freight forwarder and global logistics. The question of why this industry exists has hopefully been answered. The relationships in the global logistics triad – those between shipper, carrier, and forwarder – were examined. The modal differences in these relationships were explained.

Chapter 16: WHERE DO WE GO FROM HERE: AREAS OF FUTURE RESEARCH

16.1 Introduction

The previous chapter alluded to other areas for future research. There are two directions research in this area can go. One is by applying TCT in conjunction with intermediary-based triadic concepts to service and product intermediaries and supply chains. The second is to remain in the substantive area by continuing to explore global logistics. This chapter will look at both these possibilities.

16.2 TCT applications

The consideration of intermediaries and triadic relationships potentially opens up new research venues. The area most specific to freight forwarders is that of other service intermediaries. Applying the research knowledge gained from this work to service intermediaries such as travel agents could prove interesting and rewarding. It is often said in the forwarding industry that the major difference between travel agents and freight forwarders is that passengers require unusual 'packaging', are self-loading and unloading, deliver themselves to and from the airport, and make more noise when left on the tarmac for six hours!

Pure travel agents – those that do not run charters or purchase transport and accommodation space in advance in bulk – gain most of their revenue from commissions paid to them by the vendors of the service. They don't have the luxury of consolidation or supplementary service revenue as do forwarders.

Much as with airfreight forwarders, travel agents who deal with airlines are finding their relationships fluctuating amongst that of customer,

collaborator, and competitor. Travel agents have also faced – and are still facing – the threat of disintermediation, perhaps on a greater scale then many other intermediaries. Even before electronic commerce and travel websites (Stern & Weitz, 1997; Berghel, 2000) there were airline-owned computer reservation systems (CRS). Discussion about travel agent disintermediation caused by these CRSs was common in the early 1970s (Copeland & McKenney, 1988; Konsynski, 1993). In the last decade large travel agents (Mills, 1994) and airline-derived travel agents (Stern & Weitz, 1997) have gone on-line to bypass traditional travel agents. Travelocity, a subsidiary of American Airlines, the developer of SABRE, the original CRS, was reportedly number three in revenue for all e-commerce companies.

The opportunity exists to apply the transaction cost instrument used in this research to the travel agent/airline/air passenger triad. With no price (dis)advantages applicable (at the time of writing) only the consumer's perception of the costs of transaction might affect the choice of vendor. In a way, such a comparison has already been made. Berghel carried out a personal non-scientific cost-benefit experiment using both on-line direct reservations systems and a travel agent (Berghel, 2000).

In a more general vein, intermediaries in all industries face the threat of disintermediation. Many firms consider 'leap-frogging' an upstream supplier and dealing directly with the supplier to this vendor. However, in so doing, the purchasing firm may take on additional costs, many not accountable, in addition to the probable savings expected. What value does this intermediate firm offer to the purchaser? And in whose favour, if any, is the difference in costs of transacting between these two firms?

The theme of disintermediation leads more broadly to supply chain contraction. It seems there is a logical progression from reducing the number of vendors one deals with to reducing the length of the supply

chain itself. Curtailing the number of vendors merely reduces the number of supply chains in which the purchasing firm is involved. The next step from reducing the number of supply chains would be to shorten those that exist. This can be seen in the (retail) on-line marketing efforts of large manufacturers and primary suppliers. From Travelocity to on-line brokerage houses to software suppliers, vendors are attempting to get closer to the consumer.

Except for the raw material supplier and final purchaser, every node on a supply chain is an intermediary node and faces being cut off. Thus, most businesses could face disintermediation. For those firms considering contracting their supply chains the concepts and instrument used in this research could be applied to a comparison of the present versus potential scenario.

However, consideration of actual transaction costs and production cost (dis) advantages can only be achieved for those suppliers immediate to the firm. Second tier vendors (i.e., those who supply the supplier to the firm) are divorced from the purchasing firm. Any transaction costs between these second tier vendors and the primary vendor are absorbed and contribute to production costs making up the price offered by the *primary vendor to the purchasing firm. Rationalisation* of transaction costs requires a dyadic and adjacent *relationship.*

DISINTERMEDIATING THE IMMEDIATE VENDOR

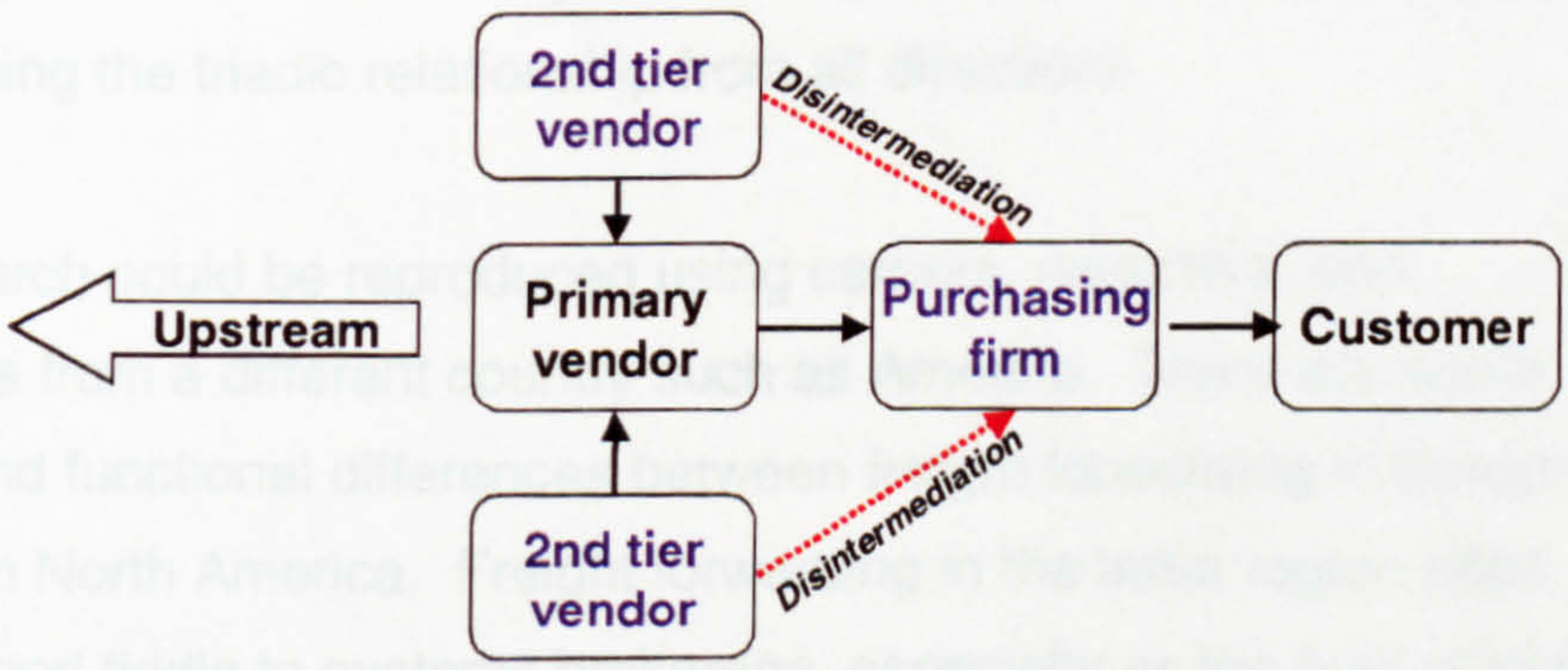

Figure 16-1

Therefore, the purchasing firm must measure their corporate *perception* of existing and potential transaction costs. They could ask what is the present cost of transacting with this primary vendor and what value do they add plus what might be the costs of transacting with this second tier vendor? The difference in perceived transaction costs, if any, in conjunction with value offered and/or any price advantage held by either vendor would assist the purchasing firm in deciding whether or not to bypass the primary vendor.

16.3 The global logistics triad

The initial continuation of this research would be to balance purchasers of airfreight by adapting the sampling frame and targeting major direct users of the airlines. It may be possible to discover major transaction cost differences between those global shippers who use airlines for the majority of their freight and the respondents in this research. That would further validate the work done here.

In its simplest form, triadic research is made up of three dyads, each with two parties. Looking the other direction in the dyad might prove interesting and rewarding. Some writers have advocated TCT-based research from the perception of the supplier or from both directions (Bakkeland & Pitt, 1994; Majumdar & Ramaswamy, 1995; Artz, 1999). The possibility exists of examining the triadic relationship from all directions.

The research could be reproduced using carriers, exporters, and forwarders from a different country such as America. There are some cultural and functional differences between freight forwarding in Europe and that in North America. Freight forwarding in the latter region often plays second fiddle to customs brokerage, especially as the bulk of trade

originally was between the U.S.A. and Canada. For forwarders in North America, there is also a tendency to not own transportation assets such as trucks (Bowman, 1994). Exporters may perceive the costs of transacting with these 'pure' forwarders differently than in Europe.

Another transaction cost aspect of freight forwarding might be to transfer this research into ocean freight. With far more exporters directly using shipping lines the perceptions of transaction costs would be more easily balanced between intermediary and disintermediation. As the possible production cost/price advantages of the forwarder may be less relative to the ocean carrier the *total* cost advantage the forwarder has in airfreight may not exist with ocean freight.

If the latter scenario exists the forwarding industry may see an erosion of the freight forwarder's position in ocean freight. Disintermediation may be a real possibility. However, based on the research carried out in this thesis, the airfreight forwarder appears to have a strong position in global logistics. To paraphrase Mark Twain, "Rumours of the death of freight forwarding have been greatly exaggerated."

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CRANFIELD UNIVERSITY

SCHOOL OF MANAGEMENT

Centre for Logistics & Transportation

PhD THESIS

Academic Year 2000-2001

RICHARD FORD

THE VALUE PROPOSITION IN INTERNATIONAL FREIGHT: THE CONTRIBUTION OF THE FREIGHT FORWARDER TO THE GLOBAL LOGISTICS TRIAD

VOL 2

Supervisor: Dr. Derek Wright

June 2001

LIST OF APPENDICES

Appendix A:

INTERVIEW SCHEDULE

Respondent Name: _____

Company: _____

Group: _____

Address: _____

Telephone: _____

Date: _____

Time: _____

2

Questions can be answered subjectively, in your capacity as a practitioner within your own company and objectively, in general, as an expert in the industry.
Common questions to all three groups:

1 What functions do carriers, shippers, and forwarders do for each other??

Quantitative feedback:

i ranking of functions for each participant

Probing questions:

i what does a forwarder do for a carrier? for a shipper?
what does a carrier do for a forwarder? for a shipper?
what does a shipper do for a carrier? for a forwarder?
ii what function(s) does each participant do for the other two participants?
iii rank the importance of these functions.
iv How does the forwarder do this?

4

2 Do you see these functions changing?

Quantitative feedback:

i Yes/No

ii major change

iii rank changes

Probing questions:

i What is the one major change in function for the carrier? Rank any others.

ii What is the one major change in function for the forwarder? Rank any others.

iii What is the one major change in function for the shipper? Rank any others.

3 How would you describe the relationship(s) between the shipper, forwarder(s) and carrier(s)?

Quantitative feedback:

i ranking of above relationships (1 through 3)

Probing questions:

i Where do you place the forwarder in relation to the carrier?
ii If listing 3 or more relationships please rank the top three.
iii Note the provision of a number of forwarders and carriers
- do shippers deal with many forwarders?
- do shippers deal with many carriers?

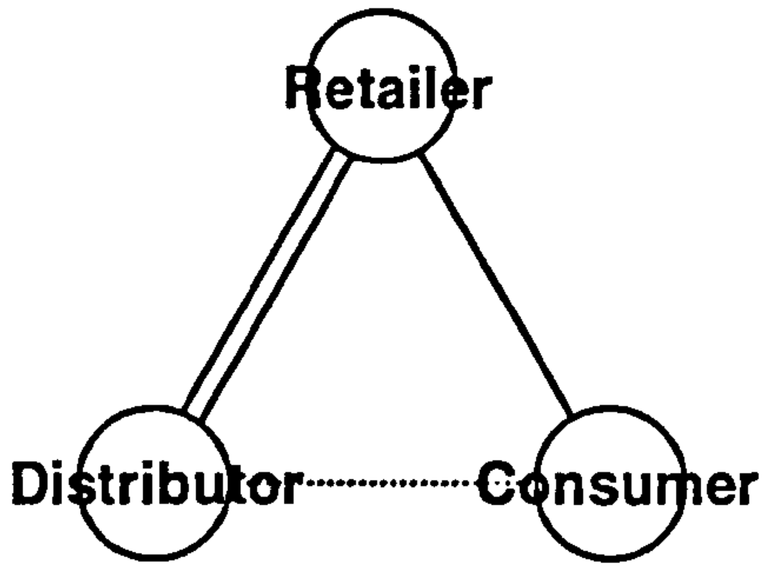
iv Are the relationships between these participants formal, contractual, strong or over a long-term? Or are they temporary, transactional, weak, or random in nature?

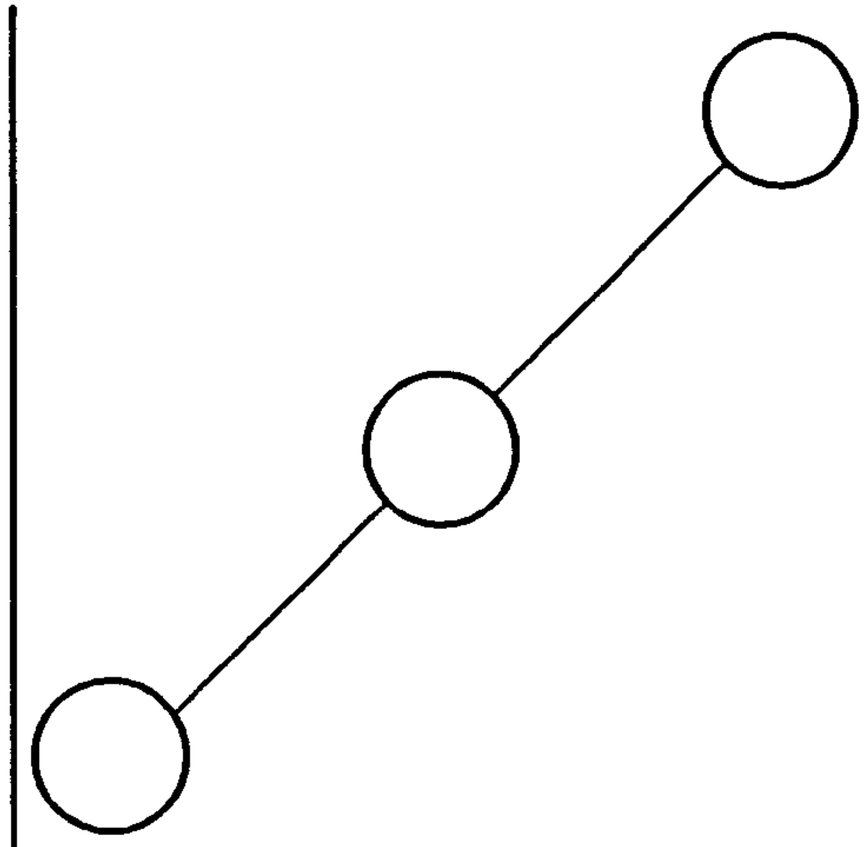
4. Please illustrate this/these relationship(s) with diagram(s) if possible. I have provided various examples which you can use, adapt or replace. An example of a relationship diagram might be that between the manufacturer, wholesaler and retailer as shown. Circles are used to represent the participants and lines of varying thickness and/or type are used to represent the relationships.

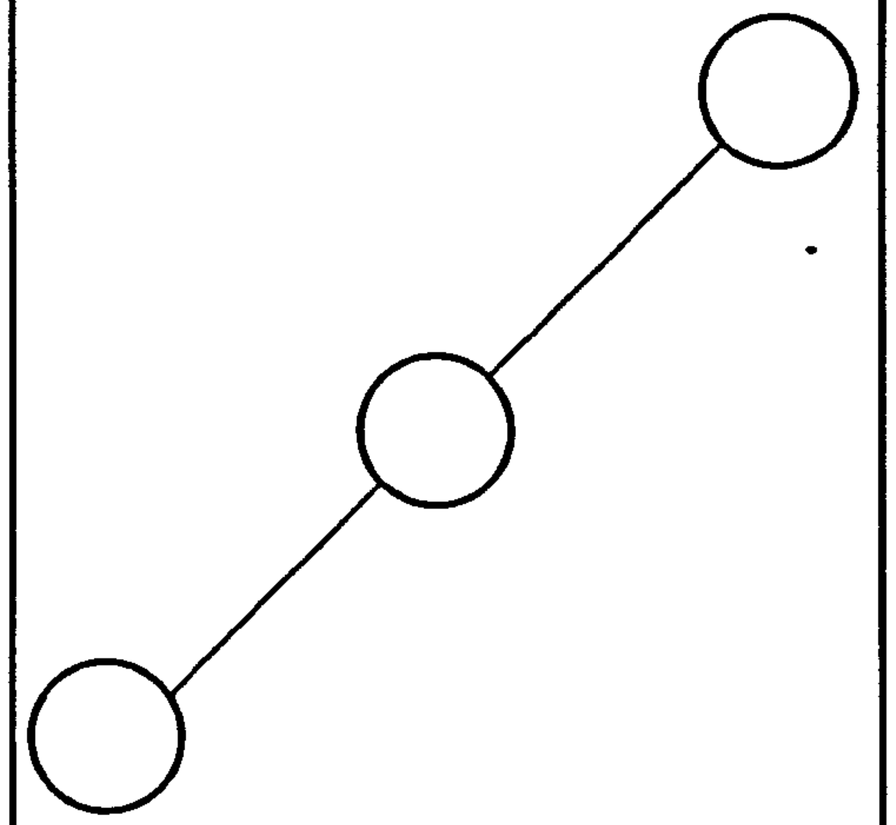
Quantitative feedback

i graphic as per quantitative feedback in Question 1

Example







S

F

Strong relationship

Weak relationship

No relationship

S Shipper

F Freight forwarder

C Carrier (indicate air or ocean)

10

5 Are the relationships changing between these three participants?

Quantitative feedback:

i agree/disagree (change/no change)
- increase/decrease in number
- stronger/weaker relationship
- contractual/transactional

ii <u>major</u> change

iii when?

iv <u>major</u> factors?

Probing questions:

i If so,
- a why and how are they changing?
  - 1 Is there an increase or decrease in the number of forwarders and/or carriers with which a shipper deals?
  - 2 Is the relationship between shipper and forwarder and/or shipper and carrier becoming stronger or weaker?
  - 3 Is there a tendency for the relationships between shipper, forwarder, and carrier to become more formal or to be contracted over a longer-term?
  - 4 Is there a tendency for these relationships to become more random or casual?
- b what <u>major</u> change is occurring?
- c over what time period? when?
- d what factors within the industry and outside of it are causing this/these change(s)?

ii If not, why not?

6. We've discussed the functions performed by these participants and the relationships between them. How would you describe each of these 3 players? What role or roles would you to ascribe to them?

Quantitative feedback:

i ranking of roles for each participant

Probing questions:

i If you consider the carrier, shipper and forwarder as actors in a play what roles would each participant portray?

ii How are the forwarder, carrier and shipper portrayed by the others?

- If listing 3 or more roles please rank the top three.

7 Do you see these roles changing between these three players?

Quantitative feedback:

i yes/no?

ii <u>major</u> change

iii when?

Probing questions:

i If so,
   a how and why are they changing?
   b what is the one major change?
   c over what time period? when?
   d what factors inside the industry and outside of it are causing this/these change(s)?

ii If not, why not?

8 Do shippers often or occasionally deal directly with carriers rather than through forwarders?

Quantitative feedback:

yes/no (Q. main)

Yes

i major advantage (Q.8.i.a)

ii major disadvantage (Q.8.i.d)

iii major factor leading to direct dealing (Q. 8.i.f)

iv increase/decrease (Q.8.i.g)

- when? (Q.8.i.g)

No

i major disadvantage (Q.8.ii.a)

ii major advantage (Q.8.ii.d)

iii major factor contributing to not dealing directly (Q.8.ii.f)

iv increase/decrease (Q.8.ii.g)

- when? (Q.8.ii.g)

Probing questions:

i if yes,
- a Why would shippers deal directly with a carrier, either for a single shipment on in general?
- b What factors would affect a decision to deal or not to deal directly with a carrier? (i.e., external or internal? mode of transport?)
- c Would such a decision be more a corporate decision or a personal decision (on the part of the shipping manager)? or a combination of both?
- d what disadvantages might there be? why?
- e what is the one major factor contributing to shippers dealing directly with carriers?
- f do you see such direct dealings increasing or decreasing in the future? when? over what time period?

8 Do shippers often or occasionally deal directly with carriers rather than through forwarders?

Quantitative feedback:

yes/no (Q. main)

Yes

i major advantage (Q.8.i.a)

ii major disadvantage (Q.8.i.d)

iii major factor leading to direct dealing (Q. 8.i.f)

iv increase/decrease (Q.8.i.g)

- when? (Q.8.i.g)

No

i major disadvantage (Q.8.ii.a)

ii major advantage (Q.8.ii.d)

iii major factor contributing to not dealing directly (Q.8.ii.f)

iv increase/decrease (Q.8.ii.g)

- when? (Q.8.ii.g)

Question 8 (continued)

ii if no.

a what disadvantages might there be? why?

b What factors would affect a decision to deal or not to deal directly with a carrier? (i.e., external or internal? mode of transport?)

c Would such a decision be more a corporate decision or a personal decision (on the part of the shipping manager)? or a combination of both?

d what advantages might there be? why?

e what is the major factor contributing to shippers not dealing directly with carriers?

f do you see such direct dealings increasing or decreasing in the future? when? over what time period?

9 What part does information play in the interaction amongst shippers, forwarders and carriers?

For purposes of feedback please rank from 1 to 7 where 1 is not important at all and 7 is the most important component.

Qualitative feedback:

i importance of information - Likert scale
ii sources of information - rank/most important
iii type of information - rank/most important
iv format of information - rank/most important
v how often updated (for each participant)?
- effect of size on above

Probing questions:

i How valuable or important is information?

ii From whom is information received? What are the sources of information? Which sources are the most important - rank/which is the most important?

iii What sort of information do shippers, forwarders, and carriers receive from each other? What sort of information do they provide back? Which type of information is the most important or rank?

iv In what formats do shippers, forwarders, and carriers provide and/or receive information - paper/verbal (face-to-face or telephone)/electronic/other? Which format is the most important or rank?

v a Forwarders:
How often do forwarders update information concerning rates/ schedules/etc.? Does size of forwarding firm play a part in the frequency concerned?

b Carriers:
How often do carriers update information concerning rates/ schedules/etc.? Does size of carrier firm play a part in the frequency concerned?

c Shippers:
How often do shippers update information (if maintained) concerning rates/schedules/etc.? Does size of shipping firm play a part in the frequency concerned?

Appendix B: Sample Interview

Note that NUD*IST requires that transcripts be entered in monospace font (i.e., Courier) without hard returns and other formatting (i.e., as a *.txt file). The use of upper case font is suggested so that the interviewer's speech can be differentiated from the interviewee's. The asterisk preceding each question is to provide NUD*IST with a symbol to find and gather up as, for example, "*Q1" followed by the question itself and the subsequent answer. The first three lines are the header which appear with every bit of text called up in NUD*IST.

*Jan Huizeling, TNT Logistics
*Round 1 - April 4,1996
*Sub-group: Forwarder/Intermediary

*WHAT I'M LOOKING AT HERE IS THE POSITION NOW WITH INTERMEDIARIES, CARRIERS AND SHIPPERS. SHIPPERS ARE UNDERSTOOD AS THE PEOPLE WHO MOVE THE GOODS, QUITE OFTEN THE TERM EXPORTERS IS ALSO USED
JAN HUIZELING:
We use the term shippers as our customers - the people who wish to move the goods. I OFTEN USE THE TERM TO ENCOMPASS IMPORTERS AS WELL. PLEASE ANSWER SUBJECTIVELY AS A PRACTITIONER WITHIN YOUR OWN COMPANY AND OBJECTIVELY, IN GENERAL, AS AN EXPERT IN THE INDUSTRY.

*Q1 WHAT DOES EACH PARTICIPANT DO FOR THE OTHER TWO PARTICIPANTS? WHAT SORT OF FUNCTIONS? WHAT ARE THE MAIN ONES?
JAN HUIZELING:
If you took a look at it at a very high level, I would see the logistics provider, the intermediary, doing part of the planning function and the majority of the management function. If you look at the carrier I see him doing the operational functions. That's at a very high level. Focus a bit more on the functions of the intermediary it starts to become - though we're very early in that trend - they start to become the back office of a manufacturer or of a retailer. So they start to look at the total back office process. That is something which follows a trend which is (sic - has) gone on for a while in banking and in insurance where there are large contracts where that industry asks for a total back office from, typically, IT service companies because they found out that integrating these information flows is the biggest trick in the back office. There are insurance companies in the USA who have outsourced their total claim handling throughout their company. And I think that is something which you will see in manufacturing - people will start to ask for the total package.

*Q1i WHAT IS THE SHIPPER'S FUNCTION?
JAN HUIZELING:
I think the shipper has a very clear function/role in the planning function because he is the one who can tell the logistics provider where the market will be going, where and when he will introduce new products, where/what kind of service levels he expects, and what

kind of cost of service he expects. So he will set the operating parameters for the whole scene and - that's one - secondly, it's very important of him to make sure that his internal processes provide the logistics provider with that much information so that the logistics provider is able to align his processes with the shipper - mesh. THE LOGISTICS PROVIDER SHOULD BE REACTIVE TO THE SHIPPER'S NEEDS AND PROACTIVE BECAUSE HE MUST PLAN IN ADVANCE. Exactly.

*Q3 HOW WOULD YOU DESCRIBE THE RELATIONSHIPS BETWEEN THE SHIPPER, INTERMEDIARY AND CARRIER? HOW WOULD YOU DEFINE THE RELATIONSHIPS? DEFINE IN TERMS OF NUMBERS, STRENGTHS, LENGTHS
JAN HUIZELING:
Typically, when looking at our industry, the relationship between us, being the intermediary, and the shipper is a long-term one based on 5 year contracts, 10 year contracts, and based on defined service levels where service is more important than cost because the relationship is based on (lets use this special word) "customer intimacy". If you look at the relationship between us and the carrier (it) is one very much based on short-term contracts. BY SHORT-TERM WHAT DO YOU MEAN? Probably, once off or months or a year. Typically based on price because we are looking for the lowest price obviously within a certain price range but we are looking for operational excellence within the right cost. That's a fair description: customer/intermediary are long-term; intermediary/carrier relationships are short-term.

*Q4 I NOTICED YOUR FINGERS MOVING THERE WHICH MEANS YOU'RE PROBABLY A GRAPHICS PERSON LIKE ME. I WOULD LIKE YOU TO ILLUSTRATE THOSE RELATIONSHIPS WITH DIAGRAMS IF POSSIBLE. I'VE PROVIDED VARIOUS EXAMPLES WHICH YOU COULD USE, ADAPT OR DISCARD. THERE IS AN EXAMPLE THERE OF A MANUFACTURER/WHOLESALER/ RETAILER RELATIONSHIP. YOU CAN USE CIRCLES AND LINES. HOW WOULD YOU GRAPHICALLY DEFINE THE RELATIONSHIP? I NOTE FROM YOUR DIAGRAM THAT THE SHIPPER COULD QUITE OFTEN MAINTAIN A RELATIONSHIP WITH THE CARRIER.
JAN HUIZELING:
Yes, because they are the ones who would pick up the goods and see them and talk to them so in terms of ...this is a long-term contract (shipper/intermediary); this is a short-term contractual relationship (intermediary/carrier); and this is a day-to-day contact relationship (shipper/carrier).

*Q3 IT IS INTERESTING THAT YOU HAVE DEFINED 5 TO 10 YEARS AS LONG-TERM AND ONE YEAR AS SHORT TERM. DO YOU THINK THIS IS DIFFERENT FROM FORWARDERS - THE RELATIONSHIPS BETWEEN INTERMEDIARIES SUCH AS YOURSELF AND CARRIERS AND SHIPPERS AND THOSE RELATIONSHIPS BETWEEN INTERMEDIARIES SUCH AS FORWARDERS?
JAN HUIZELING:
I'm not sure. Yes, I think they are because the forwarder has got this relationship because he wants to build his own virtual network and we are not necessarily looking for that because we are making those contracts based on dedicated contracts we have. So we do not try to build a virtual network with those carriers - we try to serve as one customer through a contract so - sounds a bit harsh - but we are not interested in a very long good relationship with a carrier. We want a good price and a good service and that's it. That might change from day-to-day. In our case (as in many other cases) this one here could be a TNT company. As soon as we start to talk about express freight this is definitely, most times, a TNT operated company. (THE CARRIER IS OFTEN A TNT COMPANY). Although there is still a short-term contract the relationship is obviously very different from one with a general freight carrier with whom we don't have a relationship. We have a brother-sister relationship and there are preferential rates - it's a different kind of relationship.

*Q5 DO YOU THINK THESE RELATIONSHIPS ARE CHANGING BETWEEN THESE 3 PARTICIPANTS? IN WHAT WAY?
JAN HUIZELING:
(long pause) Yes. If I look at customer-logistics company (relationships) there is a trend in the industry where customers stop outsourcing functions - outsourcing transport or warehouse functions - they now start to outsource processes. THEY'VE ALREADY OUTSOURCED THE LOGISTICS FUNCTIONS? They now want to outsource more functions - not just individual elements but as a single function - the logistics operating functions. So the relationship between the logistics service provider and the customer is getting more and more into one of a partnership - they're forming a business network. So that is definitely changing. If I look at the logistics provider-carrier relationship that is - it depends a bit - a lot of carriers now try to become logistics providers. You see more and more guys who own a truck who all of a sudden - because they

are in a commodity business they hardly make any money. I think the margin is less than 1%. So they are looking for ways to improve their margin so they move into the logistics industry. So that relationship is becoming more and more difficult.

*Q5ia1 DO YOU THINK THERE HAS BEEN AN INCREASE OR DECREASE IN THE NUMBER OF INTERMEDIARIES WITH WHOM A SHIPPER MIGHT DEAL?
JAN HUIZELING:
I guess there has been a decrease because the general trend in the industry is to reduce the number of service providers with whom you are working. That's definitely a decrease. There is also a decrease in the number of carriers with whom a shipper might deal.

*Q5ia2 DO YOU THINK THE RELATIONSHIP BETWEEN THE SHIPPER AND THE INTERMEDIARY IS BECOMING STRONGER OR WEAKER? HOW ABOUT BETWEEN A SHIPPER AND A CARRIER?
JAN HUIZELING:
(Between shipper and intermediary) Stronger. (Between shipper and carrier) That is becoming weaker.

*Q5ia3 DO YOU THINK THERE IS A TENDENCY FOR THE RELATIONSHIPS BETWEEN SHIPPERS AND INTERMEDIARIES AND CARRIERS TO BECOME MORE FORMAL, OR TO BE CONTRACTED OVER A LONGER TERM? 5 TO 10 YEARS IS A FAIRLY LONG TERM.
JAN HUIZELING:
It's a very long term (referring to 5 to 10 years). As soon as you talk about asset take-over (referring to logistics intermediary's purchase/acquisition/providing of assets such as transport or storage assets) or people transfer you talk about long-term contracts because it is the only way you can justify those investments. It's a difficult question if the relationships start to become more formal (or contractual). The industry still has a way to go in defining if we see the relationship being more and more based on the outsourcing of the business processes and staff functions. The industry still has a long way to go in defining the contractual relationship among business processes because it is very difficult to define how you want to be measured on it, how you want to be paid on it, how you want to be rewarded on it, and that is a totally new thing. You talk about issues like sharing cost saving reductions, sharing in rewards based on service improvements. The whole measurement system around that is a very difficult thing.

Everybody wants it to be more formal but, I think, at least we are struggling with defining the measurement and performance criteria around it.

*Q5ia3 HOW ABOUT THE RELATIONSHIP THE INTERMEDIARY AND THE CARRIER? IS IT BECOMING MORE FORMAL OR LESS FORMAL? YOU SAY SHORTER TERM - OFTEN ONE-OFF SOMETIMES. YOU HAVE TO DIFFERENTIATE BETWEEN RELATED COMPANIES AND THOSE AT ARM'S LENGTH.
JAN HUIZELING:
Yes, I think it has become less formal - we definitely look at it as buying a commodity so it is becoming about as formal as going to a supermarket and buying something off a shelf. If your relationship with the retailer is formal than.....!

*Q5ib WHAT DO YOU THINK IS THE ONE MAJOR CHANGE THAT IS OCCURRING WITH THE RELATIONSHIPS AMONGST THESE THREE PARTICIPANTS?
JAN HUIZELING:
I think it is the performance criteria - as in a measure of quality - it is the biggest shift.

*Q5ic AND THAT HAS CHANGED OVER WHAT PERIOD OF TIME? OVER THE LAST 5, 10, ONE YEAR? OR VERY RECENTLY?
JAN HUIZELING:
Over the last 3 years - Europe and US - though I'm not directly involved - I'm hearing the signals now out of the Australian market and we don't hear anything like that out of Asia. But the USA and Europe is definitely.

*Q5id WHAT FACTORS WITHIN THE INDUSTRY ITSELF OR OUTSIDE OF THE INDUSTRY THAT ARE CAUSING THIS CHANGE - THIS CHANGE ABOUT QUALITY AS A MEASURE OF SERVICE AND THE RELATIONSHIPS?
JAN HUIZELING:
I think it is a general business trend where, corporations have to focus more and more on their core business which they have done for, I think, 10 years but they've started by focusing on it by outsourcing functions and, I think, many in the industry now have to learn that by outsourcing functions - single elements - it will only learn to short-term cost reduction; it really won't help you in the long-term. And it will even learn to more integration problems if you try to do something about the processes inside your own company, you have all those separately outsourced single element functions outside. What the trend now

is is that people start to look at outsourcing processes and try to build up, let's use the fashionable term, business networks and to manage on that basis.

*Q5id IT'S MOSTLY AN OUTSIDE FACTOR - CATCHING UP WITH THE INDUSTRY?
JAN HUIZELING:
If you look at the large part of the industry - and don't talk about banking and financing now - for the large part of the industry, the supply chain cost or logistics cost is the last frontier because of the last 10 years they've been looking at their manufacturing costs, their operating costs; they've re-engineered all of that. The only thing they haven't looked at is supply chain costs. Typically, they've spent 20% of...It's a very expensive chunk of anything. So there is a lot of gain there.

*Q6 WE HAVE DISCUSSED SOME OF THE FUNCTIONS PERFORMED BY EACH OF THESE PARTICIPANTS. HOW WOULD YOU DESCRIBE EACH OF THESE THREE PLAYERS? WHAT ROLE OR ROLES WOULD YOU ASCRIBE TO THEM? FOR EXAMPLE, IF YOU WERE TO THINK OF THEM AS ACTORS IN A PLAY WHAT ROLES WOULD YOU THINK EACH PORTRAYS? HOW DO YOU THINK A CARRIER MIGHT DESCRIBE AN INTERMEDIARY? LOVE AND AFFECTION/NECESSARY EVIL?
JAN HUIZELING:
Difficult. That's a very interesting point. I think they have seen as a necessary evil. Certainly, the relationships have not been good. However, some of those carriers have now come to the conclusion that the only way they can survive is by focusing on being excellent operators. And make sure they have excellent relationships with logistics companies because they see that their direct relationships with shippers will decrease. They have also now seen the benefits to themselves of having a few single contacts in the market who will provide them with all the business. That goes both for carriers and warehouse operators and so. If I look at the role of the logistics provider - let's take it into a symphony orchestra. We would see our role as that of the conductor of the orchestra. We would not. I think this is a good (analogy)..! We would see the carriers as the musicians in the symphony orchestra, ourselves as being the conductor, setting the pace, defining the service, defining the quality of the sound and I would see the shipper as the composer of the music so he defines the beginning and the end

and what kind of tune he wants to hear. The audience would be the customers of the composer. It's a good analogy!!

*Q2 DO YOU SEE THESE FUNCTIONS OR ROLES CHANGING NOW OR IN THE FUTURE? DO YOU SEE A REDUCTION IN THESE FUNCTIONS?
JAN HUIZELING:
No I see these functions as described remaining as they are for a while. I think we are at the beginning of that whole process (cutting edge) so I don't see any sudden changes there.

*Q2 YOU DID MENTION CARRIERS MOVING INTO SOME OF THE FUNCTIONS INTERMEDIARIES CARRY OUT.
JAN HUIZELING:
Yes, we are one of those ourselves. They can only do that - and I'm absolutely convinced of that - if they do it the same way we have done it and a few others like Ryder by treating it as a totally separate business. So if they want to do it yes they can do it and they'll probably succeed but they can only do it by playing the two roles separately. THEY HAVE TO SHOW THEIR CUSTOMERS, THE SHIPPERS, THAT THEY AREN'T GOING TO DEPEND ONLY ON THEIR ASSETS? Exactly. So they might go into this additional role but that will still leave them in the role of non-arms length providers. We've got within TNT - we are trying that now within the US market - where going back to my analogy (of the symphony orchestra) - they might try to become from the conductor also the composer. Because there are businesses which are highly dependent on your logistics performance i.e., mail order companies - we have ideas and we are actually trying it. Not to go out and win an outsource contract - we just take over the whole company. And we'll just re-engineer its logistics - make it a very .... We are - and then you talk about redefinition of business scope or totally changing the business network so you have this - this diagram from _____ 5 stages: You can also apply that to ...like Americans say you can start what he calls localised exploitation I think which is the bottom left corner which so you can define it as being logistics projects taking over a warehouse so you can move your way up and at the top end where you have the highest distance that is where you have your business scope redefinition.

*Q7i LET'S GO BACK TO THAT ANALOGY OF THE ORCHESTRA WHERE THE CONDUCTOR IS TAKING OVER THE COMPOSER'S ROLE.

WOULD YOU THINK ALSO THAT THE SYMPHONY ORCHESTRA MIGHT EXPAND - THE NUMBER OF MUSICIANS THAT THE CONDUCTOR CONTROLS MIGHT GROW?
JAN HUIZELING:
Yes, definitely, because if I go back to this taking over the back office you would not only need the typical warehouse or road transporter or ocean carrier you might stop and look at IT functions (which we already do), insurance services that kind of thing. It gets broader.

*Q7ic DO YOU THINK THESE CHANGES ARE HAPPENING QUITE RAPIDLY OR THEY HAPPENING OVER A LONG TERM (IN THE FUTURE)?
JAN HUIZELING:
These are in --- there are a few companies thinking in those terms; there are a few companies who are now looking in the market for partners who want to take on this kind of business - we are obviously one of them. I think it will - the strategic change group which is comprised of those companies who have defined change as strategic - and those are the companies who are looking to do those kind of things now. Typically, the high-tech manufacturers and those kind of guys.

*Q7id WHAT FACTORS MIGHT BE INSIDE OR OUTSIDE THE INDUSTRY THAT ARE CAUSING THESE CHANGES?
JAN HUIZELING:
Outside influences like globalisation; the whole drive in the world toward mass customisation; the total change in the distribution channels: the moving/taking out of the middleman, direct shipping from manufacturer to the consumer, home shopping, and I think, if you look at the lower (I'm obviously not that long in the industry) but the industry has not changed much over the last 25 years. What we will see happening - what has happened the last five years and what will happen over the next five years - will dramatically change the whole logistics industry. I am totally convinced by that. We are right in the middle of a very, very big change and there are very few people who fully oversee the total magnitude of what is about to happen. On the one hand you see supply chains becoming more and more simple and because we take out all kinds of "constructs", we take out the middleman. People say that in 25 years we want have any shops anymore which makes it very very simple but on the other hand the key will be to compete on service so you would have need to integrate all these service aspects which is not only

transport but also the way you process your payments, the way you process your orders, the way you are able to advertise through new media.

*Q8ia DO SHIPPERS OFTEN OR OCCASIONALLY DEAL DIRECTLY WITH CARRIERS RATHER THAN THROUGH INTERMEDIARIES? WHY DO YOU THINK THEY DO THAT?
JAN HUIZELING:
Oh yes, definitely. There are still a lot of people out there who don't want to outsource, who keep the old logistics function in their own hands and only buy transport as a service. Then you have those people who outsource their logistics but still have the occasional single shipment which they take care of themselves. I think the first group is definitely the biggest.

*Q8ib WOULD SUCH DECISION TO DEAL DIRECTLY WITH THE CARRIER BE AFFECTED BY i) THE POSSIBILITY OF OBTAINING A BETTER COST OR SERVICE LEVEL BY DEALING DIRECTLY? Ii) WOULD IT BE BECAUSE THE LEVEL OF EXPERTISE OR KNOWLEDGE WITHIN THE SHIPPING FIRM, CORPORATELY OR INDIVIDUALLY, IS HIGH ENOUGH TO HANDLE IT? iii) WOULD IT BE AFFECTED ALSO BY THE REQUIREMENT ON THE PART OF THE SHIPPING MANAGER TO TAKE ON OR ACCEPT MORE RESPONSIBILITY FOR THE SHIPMENT? iv) WOULD IT DEPEND ALSO ON THE ABILITY TO COMMUNICATE?
JAN HUIZELING:
Yes (to i) Yes (to ii)Yes (to iii) What the majority of the freight forwarders haven't done over the last 10 years is look at the information they have to provide to the shippers in order to provide their service so what a lot of shippers find is that the freight forwarder is a 'black hole' in terms of information. A way around that is to deal directly with the carrier so they have direct import and they have full visibility of what is happening.

*Q8id WHAT DISADVANTAGES MIGHT THERE BE TO SHIPPERS DEALING DIRECTLY WITH CARRIERS?
JAN HUIZELING:
I think those are the obvious ones. If you deal directly you need to have all the expertise and skills to manage the whole transport process in house. That might require management time which is not focused at core processes. You are probably not able to attract the best of breed because the best of breed in transport managers will probably work for the freight forwarding industry - the whole reason why you should outsource.

*Q8ie WHAT FACTORS MIGHT CONTRIBUTE TO SHIPPERS DEALING DIRECTLY WITH CARRIERS - EITHER EXTERNAL OR INTERNAL - OR MODE OF TRANSPORT-TYPE FACTORS?
JAN HUIZELING:
It's cost - and its information availability.

*Q8if WHAT IS THE ONE MAJOR FUNCTION OR ONE FACTOR CONTRIBUTING TO SHIPPERS DEALING DIRECTLY WITH CARRIERS?
JAN HUIZELING:
Cost, definitely.

*Q8ig DO YOU SEE SUCH DIRECT DEALINGS INCREASING OR DECREASING IN THE FUTURE?
JAN HUIZELING:
I don't think there is an answer. It is highly dependent on how we as logistics providers as an industry perform over the next few years - and cost as well. We are at a very important point in time. If we, as an industry, get out act together over the next few years it will certainly decrease. But it is very well possible that we don't get our act together and we will ask very high margins for very poor service and the trend will be reversed.

*Q9i WHAT PART DOES INFORMATION PLAY IN THE INTERACTION AMONGST SHIPPERS, INTERMEDIARIES AND CARRIERS? HOW VALUABLE OR IMPORTANT IS INFORMATION? ON A SCALE OF 1 TO 7 HOW IMPORTANT IS INFORMATION?
JAN HUIZELING:
7 (laughs) It is the basis for the relationship because in a difficult relationship model like this where you have responsibility for freight being handed over twice the information is of crucial importance. Shippers find out more and more that supply chain visibility is absolutely key in providing customer service and if they want to have supply chain visibility they need have an integral information flow from carrier to freight forwarder to shipper.

*Q9ii FROM WHOM IS INFORMATION RECEIVED? WHAT ARE THE SOURCES OF INFORMATION? WHAT SOURCE IS THE MOST IMPORTANT?
JAN HUIZELING:
How can I answer this easily? Typically, the intermediary would receive information from the shipper - that's a very simple model - and the intermediary would receive information from the carrier. I think

that is the traditional, simple model. The more complex model is where the intermediary is _____ in the web and would receive information from the shipper's customers, from the shipper, and from the shipper's vendors. And in order to get the total picture then he would receive information from the carrier but also, and I think that's real important, from the transition point in the supply chain. Because where you move from road to rail or from rail to road or from road to ocean those are the typical black holes in the information chain so it's not only the carriers but also the people who take care of this transformation process at the intermodal points. There are external sources such as government, customers etc. If you look at the traditional freight forwarder model they would look only at the shipper and shipment information and only look at the carrier to get some track and trace information. If you look at the logistics provider he starts to look at the whole value chain and gets his information out of all it in order to perform his functions.

*Q9iii WHAT SORT OF INFORMATION DO CARRIERS, INTERMEDIARIES AND SHIPPERS RECEIVE FROM EACH OTHER? BY THAT I MEAN WHAT TYPE OF INFORMATION DO YOU WANT TO KNOW - DIFFERENTIATING BETWEEN SORT OR TYPE OF INFORMATION AND SOURCES OF INFORMATION? WHAT ACTUAL PIECES OF INFORMATION DO YOU WANT TO RECEIVE? WHAT DO YOU PROVIDE BACK?
JAN HUIZELING:
I think you have to differentiate between operational information and technical information. You need operational information in order to perform your day-to-day tasks and to provide the necessary service levels and then you're talking about typically event-related information. Yes, we have shipped the goods; yes, we have shipped it out of here; yes, the vessel has gone. With that you're looking at - the vent has happened, at which time, and probably at which cost. So that is the thing you need to do your day-to-day operational management of the supply chain. We would need that information as a logistics provider. What we would then, on an operational level, would provide to the shipper is only filtered information - provide information by exception. As long as everything goes well, It's all right. But as soon as something goes wrong in the total chain and that will have this effect to the end of the chain which will result in a change in the ETA at the final customer then you should inform

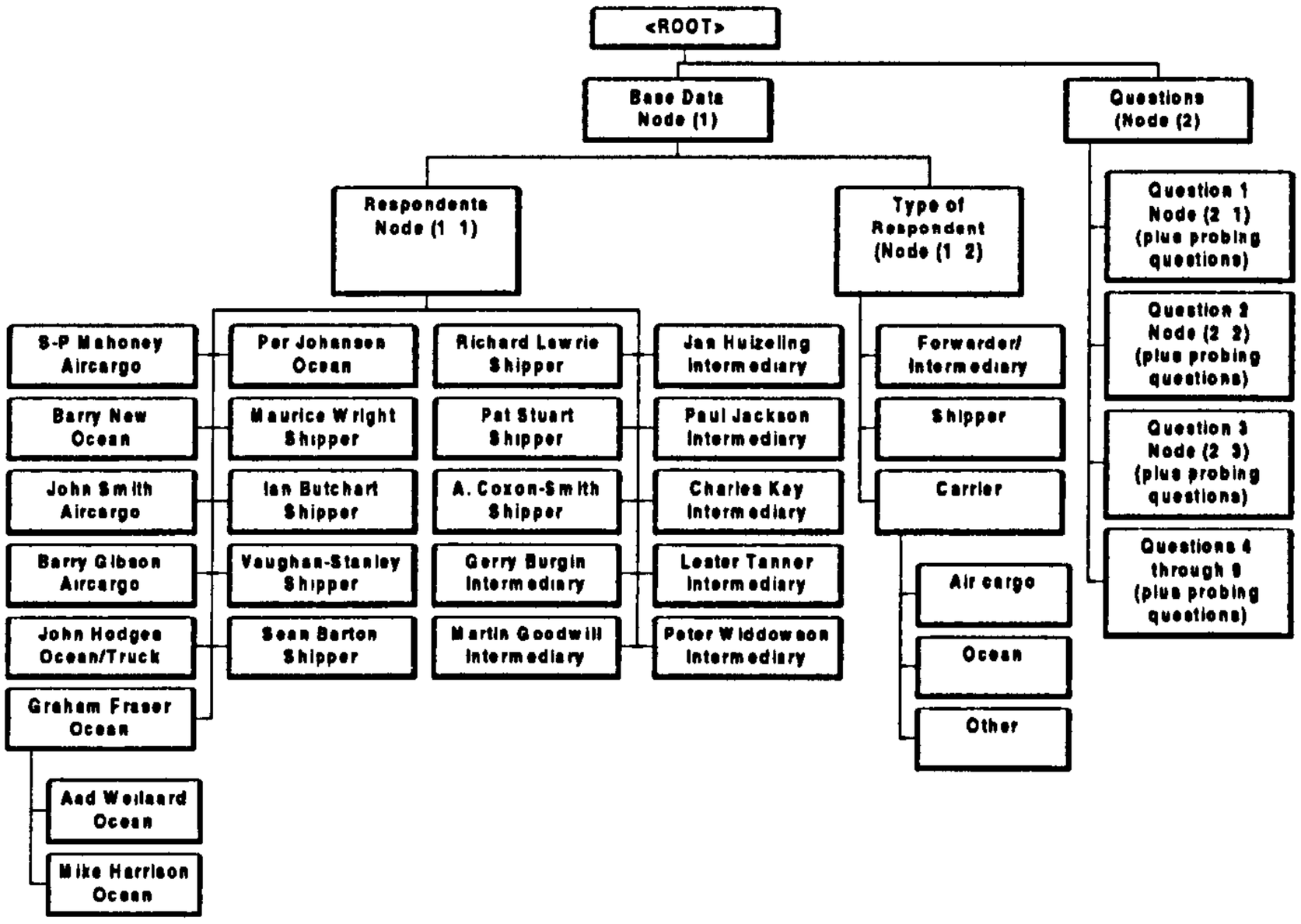
the shipper so he can take action when necessary. That's on the operational level. On the technical level you don't need any information anymore from carrier to intermediary because all the information should be in the event-related stuff. From intermediary to shipper there is a lot of technical information because you want to provide them with performance measurement, performance statistics on the agreed service levels and the performance _____ with contractually agreed. We would also like to provide them with the information how there internal supply chain is working so if we find out that we continuously receive wrong information out of their internal supply chain we want to tell them that.

*Q9iv IN WHAT FORMATS DO SHIPPERS, INTERMEDIARIES AND CARRIERS PROVIDE AND/OR RECEIVE INFORMATION? HOW IS THIS CHANGING? WHAT IS THE STRONGEST?
JAN HUIZELING:
I think it is -- electronic is becoming more and more important though it doesn't go very fast. Definitely, if you describe electronic as being EDI which is still - everybody pays lip service to it but at the end of the day it is only very very few people who really do it. This is at the operational level it is electronic. As soon as it starts to become a long-term relationship you want to have more technical information. Definitely, on the operational level you would still need the event-related information.

*Q9v HOW OFTEN DO INTERMEDIARIES UPDATE INFORMATION CONCERNING ____ INFORMATION SYSTEMS? DOES THE SIZE OF THE FIRM PLAY A PART IN UPDATING THIS INFORMATION?
JAN HUIZELING:
If I look at the industry it has nothing to do with the intermediaries. Totally customer driven. If the shipper wants to have once/hour update he gets it; if he wants once/month, he gets once/month. If you look at it from a carrier point of view I think there is a definite relationship between size and their ability to provide on-line, real time electronic information. I guess that has to do with the level of investment you would need to put into your fleet to arrange such things. So I think the bigger they are the more able they are to provide you with on-line, real time information. In the logistics or intermediary world I don't see that relationship.

Appendix C: NUD*IST Index Tree – Base Data

NUD.IST INDEX TREE - BASE DATA



Appendix D: NUD*IST Coding Hierarchy

1 Base Data
- 1 1 Respondents' Names
  - 1 1 1 Maurice Wright
  - 1 1 2 Ian Butchart
  - 1 1 3 R. Vaughan-Stanley
  - 1 1 4 Sean Barton
  - 1 1 5 Gerry Burgin
  - 1 1 6 Martin Goodwill
  - 1 1 7 Jan Huizeling
  - 1 1 8 Paul Jackson
  - 1 1 9 Charles Kay
  - 1 1 10 Lester Tanner
  - 1 1 11 Peter Widdowson
  - 1 1 12 S-P Mahoney
  - 1 1 13 John Smith
  - 1 1 14 John Hodges
  - 1 1 15 Barry Gibson
  - 1 1 16 Barry New
  - 1 1 17 Per Johansen
  - 1 1 18 Richard Lawrie
  - 1 1 19 Pat Stuart
  - 1 1 20 Andrew Coxon-Smith
  - 1 1 21 Canada Maritime
    - 1 1 21 1 Aad Welaard
    - 1 1 21 2 Mike Harrison
- 1 2 Type of Respondent
  - 1 2 1 Intermediary
  - 1 2 2 Carrier
    - 1 2 2 1 Ocean carrier
    - 1 2 2 2 Air Carrier
    - 1 2 2 3 Ryder
  - 1 2 3 Shipper

2 Questions
- 2 1 Q1Funcshare
  - 2 1 1 Q1iFCS
  - 2 1 2 Q1iiEachOther
  - 2 1 3 Q1iiiRank
  - 2 1 4 Q1ivForwarder
- 2 2 Q2FuncChange
  - 2 2 1 Q2iCarrier
  - 2 2 2 Q2iiForwarder
  - 2 2 3 Q2iiiShipper
- 2 3 Q3Relate
  - 2 3 1 Q3iForwarder
  - 2 3 2 Q3iiRank3
  - 2 3 3 Q3iiiNumber
    - 2 3 3 1 Q3iiiaForwarders
    - 2 3 3 2 Q3iiibCarriers
  - 2 3 4 Q3ivType

2 4 Q4RelPict
2 5 Q5RelChange
2 5 1 Q5iYes
2 5 1 1 Q5iaHow
2 5 1 1 1 Q5ia1RelNum
2 5 1 1 2 Q5ia2RelStrong
2 5 1 1 3 Q5ia3RelForm
2 5 1 1 4 Q5ia4RelRandom
2 5 1 2 Q5ibMajor
2 5 1 3 Q5icTime
2 5 1 4 Q5idFactors
2 5 2 Q5iiNo
2 6 Q6Roles
2 6 1 Q6iPlay
2 6 2 Q6iiInternal
2 7 Q7RoleChange
2 7 1 Q7iYes
2 7 1 1 Q7iaHow
2 7 1 2 Q7ibMajor
2 7 1 3 Q7icTime
2 7 1 4 Q7idFactors
2 7 2 Q7iiNo
2 8 Q8Direct
2 8 1 Q8iYes
2 8 1 1 Q8iaWhy
2 8 1 2 Q8ibAffect
2 8 1 2 1 Q8ib1Cost
2 8 1 2 2 Q8ib2Know
2 8 1 2 3 Q8ib3Risk
2 8 1 2 4 Q8ib4Commune
2 8 1 2 5 Q8ib5Other
2 8 1 3 Q8icCorpPersonal
2 8 1 4 Q8idDisadvantages
2 8 1 5 Q8ieFactors
2 8 1 6 Q8ifMajor
2 8 1 7 Q8igIncreaseTime
2 8 2 Q8iiNo
2 8 2 1 Q8iiaWhyNot
2 8 2 2 Q8iibAffect
2 8 2 2 1 Q8iib1Cost
2 8 2 2 2 Q8iib2Know
2 8 2 2 3 Q8iib3Risk
2 8 2 2 4 Q8iib4Commune
2 8 2 2 5 Q8iib5Other
2 8 2 3 Q8iicCorpPersonal
2 8 2 4 Q8iidAdvantages
2 8 2 5 Q8iieFactors
2 8 2 6 Q8iifMajor
2 8 2 7 Q8iigIncreaseTime
2 9 Q9Info
2 9 1 Q9iValue
2 9 2 Q9iiSource
2 9 3 Q9iiiType

2 9 4 Q9ivFormat
2 9 5 Q9vUpdate

3 Functions
3 1 of Intermediaries
3 2 of Carriers
3 3 of Shippers

4 Role
4 1 PercDiff
4 2 RolesPerShipper
4 2 1 Role Change
4 3 RolePerIntermediary
4 3 1 Role Change
4 4 RolePerCarrier
4 4 1 Role Change
4 5 RoleFeedback
(4 5 1 through 4 5 22 for each respondent)

5 Relationships
5 1 Ad hoc
5 2 Honesty
5 3 Length
5 4 Formality
5 4 1 Contractual
5 5 Strength
5 6 Risk
5 7 Loyalty
5 7 1 Trust
5 8 Power-Dependence
5 9 Control
5 10 Flexibility
5 11 Reliability

6 Future
6 1 of Intermediaries
6 2 of Carriers
6 3 of Shippers

7 Notable Lines

8 Consignment
8 1 Size
8 2 Product
8 3 Volume
8 4 Container
8 4 1 FCL

9 Consolidation

10 Hierarchy
10 1 Targetting
10 2 Shipping Mgr

10 3 Logistics Mgr.

11 Direction
- 11 1 Positive
- 11 2 Negative

12 Three Cs
- 12 1 Customer
- 12 2 Collaborator
  - 12 2 1 Partner
  - 12 2 2 Alliance
- 12 3 Competitor

13 Travel Agents

14 Size
- 14 1 Portfolio
- 14 2 Relative Size

15 TransportMode
- 15 1 Ocean
- 15 2 Air
  - 15 2 1 Passenger
  - 15 2 2 Freighter-Byproduct
  - 15 2 3 Committment
- 15 3 Multimodal

16 Time

17 Tradition

18 Neo-Intermediary
- 18 1 Outsourcing
  - 18 1 1 Deskilling
- 18 2 One stop shop
- 18 3 Evolve
- 18 4 In-house
- 18 5 Partnership

19 Terms of Sale

20 S-C Participants
- 20 1 Disintermediate

21 Information
- 21 1 Transparency
- 21 2 EDI
- 21 3 Internet
- 21 4 Knowledge
- 21 5 Value
  - 21 5 1 Importance
    - 21 5 1 1 Milestones
    - 21 5 1 2 Value-1-7

- 21 6 Systems
- 21 7 Update
- 21 8 Info Overload

22 Direct
- 22 1 Triadic
  - 22 1 1 Negotiation
- 22 2 Affected by
  - 22 2 1 Expertise
  - 22 2 2 Price
  - 22 2 3 Responsibility
  - 22 2 4 Communication
- 22 3 CorpPersonal Level
- 22 4 Disadvantages
  - 22 4 1 Restrictive
  - 22 4 2 In-house
  - 22 4 3 Services
  - 22 4 4 Range
- 22 5 Factors Direct
- 22 6 Future changes
  - 22 6 1 Decrease
  - 22 6 2 Increase
  - 22 6 3 No Change

23 Number
- 23 1 NumFF-Ship
- 23 2 NumCar-FF
- 23 3 NumCar-Ship

24 Geographic
- 24 1 Globalisation

25 Service
- 25 1 Price-Service

26 Capacity

27 CommodityDifferentiate

28 Cost-Price
- 28 1 Cost
- 28 2 Value
- 28 3 Price
- 28 4 Investment
- 28 5 Maximum-Yield
- 28 6 Purchasing Power

29 Quality

30 Culture

31 Integrator

32 Comfort

33 Dyad Relationship
- 33 1 Relate-Int&Ship
- 33 2 Relate-Int&Car
  - 33 2 1 Relate-Int&AirCar
  - 33 2 2 Relate-Int&OCar
- 33 3 Relate-Ship&Car

34 Personal
- 34 1 Experience
- 34 2 Professionalism

35 Power
- 35 1 Power-Dependence
- 35 2 Control

Appendix E: Respondent feedback

The feedback is in two sections. Section I consists of extracts from the responses arranged by areas and by respondent group. Section II is the analysis of the data. It starts off with a simple quantitative measure of the number of lines of text in which the words 'customer', 'collaborator', or 'competitor' and their synonyms appeared. Those respondents involved in airfreight spoke about collaboration (or partnerships or alliances) whereas shipping lines didn't.

Section II continues with a table outlining the role analogies of each respondent separated by group. The role analogies of some respondents did not involve all three groups. Finally, the graphical descriptions of relational models were summarised for all respondents and separated by group. These models have been orientated on the triangle according to the degree of centrality evidenced. Each respondent received the 'triangle' diagrams for each group – shippers, intermediaries, and carriers – with his own models marked in red on his group. Shipper and carrier respondents differentiated between air and ocean while intermediaries did not.

RELATIONSHIP BETWEEN SHIPPER & INTERMEDIARY

Carriers' responses	
Mr. H. ocean	Again in respect of the area that I deal with it's relatively short term in terms of freight forwarder. You can have five freight forwarders that would go after one shipper's business and one will win. Six months later one of the other ones who lost will suddenly be the freight forwarder because they will have narrowed the price margin by another $25 or $15 or $5 or whatever they've agreed...
Mr. J. ocean	Between a shipper and an intermediary it is becoming stronger, more contractual, longer term. There is a tendency towards a shipper using less intermediaries.
Mr. N. ocean	I think there's a whole range of mutual suspicion between all three to be honest. I think that the strength of the relationships can build up over a period of time, based on mutual trust. But I think it starts out as mutual suspicion. And a lack of willing is probably to hand over control.
Mr. W. ocean	What's happening a lot is that shippers are changing freight forwarders frequently, especially in Italy, so there's a lot of competition between the freight forwarders because they are after the same business. The shipper is changing freight forwarder because he gets a better deal.
Mr. G. air	I see the relationships between shippers and forwarders becoming longer term, perhaps more formal, more contractual, stronger in comparison to being temporary or transactional.
Intermediaries' responses	
Mr. B.	You have got a number of shippers these days where they go out to official tender on a regular basis (over) one, two, or three years. I guess that is probably less than 5% of the business; it tends to be the major high tech accounts. But the vast majority is not by any fixed agreement whatsoever. It is basically a relationship that you strike up with somebody by persistence in selling. There is still a good degree of loyalty with a big big percentage of shippers. They have dealt with their agent - they are very happy with their agent over a number of years. ...But some of them, quite frequently, will say, 'OK let me have your rates', and you go in knowing damn well you're going to knock spots off what they're doing now. So you get that end of the spectrum (blind loyalty) and you get the bastard who will change for a penny a kilo - or a lunch.

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Mr. G.	The traditional forwarding relationship between the shipper and the forwarder is changing. The traditional relationship was that the shipper would jump ship for a penny a kilo because his sole function in life was to look for cheap. He would have nothing to do with looking for quality, the whole thing was driven by cost. There was no loyalty; if someone came alone tomorrow and offered you a better rate, you'd go. That's part of the lack of sophistication of the whole industry in my view. When capacity's low, prices are high and when capacity's high, prices are low, and in between everybody's ducking and diving for a penny a kilo. ...but then some companies decided that they needed a longer term relationship. In order to do that we have to be honest and we have to be able to guarantee the honesty in that relationship and the only way of doing that is to make sure that all three parties understand what they are about and what we are trying to achieve.
Mr. H.	Typically, when looking at our industry, the relationship between us, being the intermediary, and the shipper is a long-term one based on 5 or 10 year contracts and based on defined service levels where service is more important than cost because the relationship is based on "customer intimacy".
Mr. K.	I'm not aware of any significant trend which says that the relationship (between) an intermediary and a shipper is weakening. My view is that it's strengthening.
Mr. T.	We still have an awful lot of business like that (ad hoc); and there's an argument for taking it because the whole infrastructure's there and you know it allows you to build up a certain amount of pivotal weight on consolidations.
Shippers' responses	
Mr. S. B.	The difference between sea freight and air freight is, if the sea freight person says to me, 'Oh you know my boat sunk', then I do have to say, 'Oh right, so I guess my container's sunk too'. Whereas, if it was the forwarder ringing up saying the plane has crashed, I would be saying, 'I'm not interested in that'. But because I'm dealing directly with the sea freight I can't say that, and I don't feel it either.
Mr. C.	Well the carrier is definitely at the distance. I'm actually talking about air freight as well (as ocean) - the same applies. My interest is not really who carries the freight.

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Mr. L.	What we used to do, with certain markets, we'd play the game. We would say, 'Right, I'm getting £1.20 per kilo off Joe, can you give me £1.18 or £1.15?' Now we always ended up with people who would come in and offer you £1.05. At a certain point in time, perhaps 10-15 years ago, we'd have changed. Now we don't change for those reasons. We tend to create more long term contractual relationships.
Mr. W.	...forwarders saw their role changing (with European barriers dropping) and they became, rightly so, more ambitious to stay alive and make money. So they turned the esteem word *freight agent*, into *freight forwarder*, into *logistics operators*. So we've now got the growth of the forwarder into logistics.

RELATIONSHIP BETWEEN INTERMEDIARY & CARRIER

	Carriers' responses
Mr. H. ocean	You would always discuss (rates with only the forwarder and carrier present) and this is one of the areas which is particularly delicate and does cause frequently misunderstandings and upsets between lines and forwarders because with the types of organisations we both have you will not fail to have these times where you've come head to head with the freight forwarder because you have a sales organisation of your own and they have a sales organisation of their own. And those sales organisations in their attempt to bring up new business will always become head to head. ...in general terms it's a 2 way conversation between the forwarder and a line or the line and the shipper. It's between the line and the forwarder because the forwarder will invariably sell on...
Mr. J. ocean	Between intermediaries and (ocean) carriers the latter have their preferred freight forwarders just as the intermediaries have their preferred carriers due to control. The intermediary doesn't want the carrier to poach his customer. The ocean carrier wants to reduce costs. In order to do so he would try and avoid LCL in preference for FCL - the former is too expensive.
Mr. N. ocean	I think there's a whole range of mutual suspicion between all three to be honest. I think that the strength of the relationships can maybe build up over a period of time, based on mutual trust. But I think it starts out as mutual suspicion. And a lack of willing is probably to hand over control.
Mr. W. ocean	So you can have a very good relationship with a person (within the forwarding firm) and therefore he will always try and give you first refusal. But with freight forwarders the problem is you can't have a relationship, in my view, because they are after each others business. So you select a couple with whom you think there is this trust and you try to develop the business.
Mr. G. air	It has always been perceived by the airlines that the middle men rip off the shippers. The relationships between forwarders and carriers are becoming longer term, more formal, contractual, stronger.

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Mr. S. air	Forwarders want to deal with less carriers. …there will be certainly at least two, possibly three, sorts of forwarders around. There's going to be the big multi-nationals who are big, strong and are going to (have) equal or fairly balanced partnerships with a smaller number of carriers. All the big guys are saying we don't want to deal with 100 carriers, we want to deal with 10 or 15. It's not always practical from the carrier's perspective; as a base business (carriers) want to deal with perhaps the top 20 forwarders and they might want that to consume 30-40% of their business, ideally. And then they've got a middle group - it might be a smallish group, who are niche players, who are strong in one country or in one lane segment, and they want to deal with some of those. And they also want a good broad base of smaller forwarders, losing one of which would not harm their business, so having a lot of them adds to their business and tends to produce high yield. Because the big relationships with a small number of large forwarders tends to produce low yield. So that mix of business is extremely important and you want people who are stable and you want people who are unstable. You want unstable relationships, because they enable you to move market share.
Mr. H. multimodal	…the real winners were the people who could forge long term relationships and work with one another to really reduce costs, just beating up suppliers was not necessarily the best way of doing it. …We think just bringing in the suppliers every year and bashing them up - it's all very well but you're not going to make a fundamental change that which will take a significant amount of cost out.

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Intermediaries' responses	
Mr. B.	On the air side most carriers are very careful about their dealings with shippers direct. And the reason being is most of their revenues comes through freight forwarders - 80 or 90% of the business. So, one - they are concerned about putting out confused signals to the trade and it doesn't take much. (The airlines) have these ad hoc forays into the shipper's world, creating quite a bit of dust and I think now they are going to endeavour to have a proper tripartite discussion with the freight forwarder. Although the forwarder has the buying power it's a very foolish freight forwarder that goes to an airline and bangs the table and creates merry hell every time something goes wrong because you need to manage that relationship. There are many times that you're going to need that airline more than they will need you. You have to manage the relationship and remember the bad times and the good times. Where you think you have everybody by the balls when (the airlines are) struggling for cargo and they really are almost begging for it - when it goes the other way around the airlines don't forget.
Mr. G.	Certainly I would say that the links between the intermediary and the carrier can be quite strong because the carrier regarded the forwarder as being the man with the money so he becomes the customer. So I think that the intermediary has traditionally been the barrier rather than the facilitator and I think that there has to be a realignment of who is aligned to whom. I don't believe that it's appropriate for the forwarder to be the agent to the airline because I think that creates a false relationship. The relationship always should come back to the guy with the money; at the end of the day it's the customer who pays for the goods (and) that's the really important factor there.

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Mr. H.	If you look at the relationship between us and the carrier it is one very much based on short-term contracts - once off or months or a year. Typically based on price because we are looking for the lowest price obviously within a certain price range but we are looking for operational excellence within the right cost. I think they are (different from forwarder's relationships) because the forwarder has got these relationships because he wants to build his own virtual network and we are not necessarily looking for that because we are making those contracts based on dedicated contracts we have. So we do not try to build a virtual network with those carriers - we try to serve as one customer through a contract so - sounds a bit harsh - but we are not interested in a very long goods relationship with a carrier. We want a good price and a good service and that's it. That might change from day-to-day.
Mr. J.	The relationship between the forwarder who is not adding value is a strange one. It's almost a Mexican stand-off where you have the carrier, particularly in the airline field, who's very nervous about approaching the shipper because they are worried about the short-term impact on themselves which, after all, (concerns) a very perishable commodity. Whereas, in fact, the shipping lines have built much stronger relationships with the shippers themselves …
Mr. W.	There was an attempt by some major (air) carriers to get contracts operative in the industry (but) it largely failed. There may be voluntary commitments on space, tonnage and time by some of the major consolidators to some of the major carriers but, in the large, I consider it very much an ad hoc, demand-based market.
Shippers' responses	
Mr. C.	But something that would contribute to me saying, 'hey here are some guys that are committed to something more than promoting their own service', would be some more strategic alliances and I would say that with an airline that would be a very good thing.

RELATIONSHIP BETWEEN SHIPPER & CARRIER

Carriers' responses	
Mr. H. ocean	The relationship between the line and a shipper, once it's developed, can be a much longer term because the shipper can see the benefits of having a direct relationship with a line and not having the involvement of a freight forwarder who will move their traffic around many different lines. I think, generally speaking, shippers like to have a fairly consistent usage of a line so that they can get used to it.
Mr. W. ocean	You have shippers with whom you build up a relationship over the years and there is a kind of trust between you and the shipper.
Mr. H. multimodal	Personally I would go for longer term arrangements with carriers.
Intermediaries' responses	
Mr. J.	Whereas, in fact, on the shipping line side the shipping lines have built much stronger relationships with the shippers themselves...
Shippers' responses	
Mr. C.	Given the fact that all we're looking at is somebody that is actually physically going to carry our goods and get it there, the relationship between us and the carrier is one of almost a bus. As long as we can get the goods via the freight forwarder onto that particular departure, and it flies, or the ship sails, that's the relationship.
Mr. S.	What we're looking at to start next year on this particular run is a partnering arrangement, whereby we share risk, we share profit, so we will expect to see a reduction if the same volume goes down.

PARAMETERS OF RELATIONSHIPS: LENGTH

Intermediaries' responses	
Mr. B.	There is still a good degree of loyalty for a big percentage of shippers. They have dealt with their agent - they are very happy with their agent over a number of years.
Mr. G.	There was no loyalty. If someone came alone tomorrow and offered you a better rate, you'd go.
Mr. H.	... (the carriers) are the ones who would pick up the goods and see (the shippers) and talk to them so in terms of (length), the relationship between shipper and intermediary) is a long-term contract; the relationship between intermediary and carrier is a short-term contractual relationship; and (the relationship between carrier and shipper) is a day-to-day contact relationship.
Mr. J.	There is probably a tendency for these relationships to be established or contracted over a longer term rather than over 3 or 6 months - it's now one year or more, especially with taking over assets.
Mr. K.	We deal in one-offs (also). It's part of functional size as well. We also have long term contracts (with carriers), I mean long term in our industry is a year.
Mr. T.	You can only supply logistics services under some kind of contract, some kind of long term partnership. You know there's not the sort of piece of business that just comes knocking on the door and you do it once and it's gone away. Longer term relationships (between carriers and intermediaries and intermediaries and shippers) certainly.
Mr. W.	I've known large companies with very loose ended contractual (arrangements) or no contract; in fact contracts in our industry are very few and far between.
Shipping lines' responses	
Mr. H.	...it's relatively short term in terms of (the relationship between carrier and) freight forwarder. You can't really generalise but it will change from shipper to freight forwarder but I think that it's short term. The relationship between the line and a shipper, once it's developed, can be much longer term because the shipper can see the benefits of having a direct relationship with a line and not having the involvement of a freight forwarder who will move their traffic around different lines.

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Mr. J.	Between a shipper and an intermediary it is becoming stronger, more contractual, longer term. There is a tendency towards a shipper using less intermediaries.
Mr. N.	I think (the relationship between intermediary and shipper) is very much moving towards more long term transactional, in the sense that the alliances that are being formed are stronger. I think there is more commitment required and, inevitably that means more long term. I don't think there's anything different regarding (the relationship between intermediary and carrier). I think the carriers for many years have tried to cultivate long term relationships in order to provide a base load.
Mr. W.	It's not a contracted relationship, its a long term relationship. (Shippers) like us and we like them, there is trust between the two parties and you reach a kind of relationship that's very difficult to break. With freight forwarders it's more difficult because they're far more short term and its more difficult to build up that kind of relationship with a freight forwarder. A forwarder is always looking for the last dollar, a shipper may be looking a little bit more forward than the freight forwarder. Freight forwarders, they try to play one (carrier) against the other, so they are changing quicker than a shipper would. ...it's different in Northern Europe where you have a much stronger relationship between the shipper and a freight forwarder. You have relationships that have been there for 10-15 years.
Multimodal response	
Mr. H.	think most people like a longer term relationship. There can be a down side to say you're a supplier to M & S, sounds good but long term, some companies have done well while some have hardly survived because of the shear buying clout of Marks & Spencers, you can't get out of it. That's the down side of a long term relationship because you wouldn't have one presumably unless it's with a major customer.....

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Airlines' responses	
Mr. G.	I refer to (the saying) that it's all fair in love and war. I mean we forge relationships with agents, we like to think that we are partners, that we will stay together through thick and thin. Well even the best marriages don't last, something comes along and knocks one sideways. And the same applies to our relationships with agents. If an agent starts to feel he's being threatened by another agent, he will react to save himself, and if the course of action he's taking will break the relationship he has with the airline, he'll do that. So it is not forever. Wouldn't it be nice if we did stick together for 10 years and forge a great partnership and do a lot of good business together, but in the end its driven by one thing and one thing only, the bottom line, regardless.
Mr. M.	I think you have strong links (between intermediary and carrier), strong links (between intermediary and shipper), some airlines are exploring (links between carrier and shipper) so there is a link there.
Mr. S.	There's going to be the big, strong multi-nationals who are going to (have) equal or fairly balanced partnerships with a smaller number of carriers. All the big guys are saying we don't want to deal with 100 carriers, we want to deal with 10 or 15.
Shippers' responses	
Mr. S. B.	We don't have any contracts with our global intermediaries.
Mr. C.	There's nothing saying that it starts and ends, it's ongoing, we have operational reviews on a by monthly basis
Mr. L.	We tend to create more long term relationships. I think we've built up over the years some good working relationships like that. Also, if they know it's a long term relationship they're willing to provide a lot more services.
Mr. S.	They are fairly loose, but extremely important. There's no formal contract signed. I would sit with some representative of a respective forwarding agent and they would tell me what they have to offer. Before we got to that stage however, I would put together a formal tender document of all the business that I have control of and I would invite people to come in and sit and talk to me and (I would) say, 'this is the traffic that I have, this is the profile of the business that we move globally, would you like to quote for any or all of it'? It's on an irregular basis.
Mr. V-S.	The contracts we have are normally two or three years. It's because we are asked by our contract staff to go down the long contract road.

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Mr. W.	Then they said, 'well we can give you a yearly contract'. And some of the big firms then put it out for contract, accountant driven probably. They put it out and they all want quotes for it. So now we have big companies going out to tender once every three years, they all grab for the business.

PARAMETERS OF RELATIONSHIPS: STRENGTH

	Shipping lines' responses
Mr. H.	…that relationship (between carrier and shipper) is very weak and in some cases (doesn't exist) at all because the freight forwarder won't let you have a relationship there, there isn't one. You don't know who (the shipper) is, and that's generally a smaller (shipper who) could be LCL or FCL. You could have (a relationship between carrier and shipper) which is even stronger. This is not unusual, but this will more than likely be a large manufacturer or producer. I would say over the last 5 years, the freight forwarders have become more and more involved in relationships like that, to the detriment of the shipping line…
Mr. J.	Between a shipper and an intermediary it is becoming stronger, more contractual, longer term. The traditional relationship (in ocean freight) is that of a strong (dyadic) relationship between the carrier and the shipper. The emerging relationship is strongest between whoever controls the cargo - shipper or his customer and the intermediary. There is, of course, a minor relationship between this intermediary and the other party whether that is the shipper or the customer.
Mr. N.	Well I think it's very much moving towards more long term transactional, in the sense that the alliances that are being formed (between shipper and intermediary) are stronger. I think there more commitment is required and therefore, inevitably that means that it's more long term.
Mr. W.	It's different for Northern Europe where you have a much stronger relationship between the shipper and a freight forwarder. You have relationships that have been there for 10-15 years In the Mediterranean the freight forwarders have a very strong influence, particularly in Italy. In Spain it's a little bit less; there are a few more shippers dealing direct. In Portugal it's about 60:40. I hope that it changes - that the shipper gets more influence - but I don't really see it. The tendency is really that the forwarders are getting stronger, that the shipper's direct influence is getting weaker…

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	Airlines' responses
Mr. G.	I'm invisible at the other end (to the shipper). (The relationships between carrier and intermediary and between intermediary and shipper) are strong but the shipper doesn't get to talk to the airline. ...there isn't (a relationship between the carrier and the shipper). I'm just saying, the shipper might try to get to the airline but can't. So his relationship with the agent is quite strong, the agent says to him, 'Leave it, trust me, leave it all to me, I'll take care of it, I'll offer you a good price, you know. Don't bother about phoning the airline, I can do it all for you, no problem'. And then the relationship between the agent and the airline is also quite good as well.
Mr. S.	There's going to be the big multi-nationals who are big, strong and are going to be equal or fairly balanced partnerships with carriers, with a smaller number of carriers. And then they've got a middle group, it might be a smallish group, who are niche players, who are strong in one country or in one lane segment, in one trade, and they want to deal with some of those... ...and they also want a good broad base (of) smaller forwarders, losing one of which would not harm their business, so having a lot of them adds to their business, and tends to produce high yield. Because the big relationships with a small number of large forwarders tends to produce low yield. So that mix of business is extremely important and you want people who are stable and you want people who are unstable. You want unstable relationships, because they enable you to move market share.
Mr. M.	I think you have strong links (between airline and intermediary), strong links (between intermediary and shipper); some airlines are exploring (the relationship between shipper and airline), so there is a link there. I describe (the relationship between forwarder and shipper and that between shipper and carrier) as minefields. The trick is how the airlines can actually take back their birthright, take (back) the power and be successful (without) alienating this group if this were to happen.

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Multimodal response	
Mr. H.	The intermediary is getting stronger I think.
Intermediaries' responses	
Mr. B.	There is still a good degree of loyalty for a big big percentage of shippers. They are very happy with their agent over a number of years. They get bombarded by all sorts of competitors with rates. I mean some, believe it or not, are not even interested in talking about the rates which I find quite amazing. That's blind loyalty. But some of them, quite frequently, will say, 'OK let me have your rates', and you go in knowing damn well you're going to knock spots off what they're doing now.
Mr. G.	Certainly I would say that the links between the intermediary and the carrier can be quite strong because the carrier regarded the forwarder as being the man with the money so he becomes the customer.
Mr. H.	So the relationship between the logistics service provider and the customer is getting more and more into one of a partnership - they're forming a business network. (Between shipper and intermediary) Stronger. (Between shipper and carrier) That is becoming weaker.
Mr. J.	On the ocean side, the shipping lines have built much stronger relationships with the shippers themselves. What is around is that in international logistics 3 years ago or even 5 years ago people were selling on a transaction basis and now they are selling more on a contractual basis. Yes, it is becoming a stronger, more contractual, because of the investment, because of the high cost of people. What it is all about is to get the customer by the balls. To get as much ownership, to do as much for that customer, to make sure he is locked into you , so that, in fact, he can't go anywhere else.

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Mr. K.	My view is that (the relationship between a shipper and an intermediary) strengthening. The relationship between ourselves and the shipper is becoming closer and stronger, that's not wishful thinking that's fact. Because of this business of going further and further into the organisation and being allowed to go further. (Our relationships with carriers are) stronger with less carriers. And there's work being done by the carriers there too in terms of meeting the challenge of the integrator. Because in simplistic terms, the carrier plus ourselves are a direct competitor to the integrator. So fewer, stronger. With the shipper stronger. There's always been a relationship between the carrier and the shipper. A number of carriers have said they want a stronger relationship with the shipper. A number of shippers have said, or rather the guys who work as logistic managers for shippers who sit on councils, have said, 'We want a relationship with the carrier'. The single biggest thing that's changed in a relationship between a company like this and its customers is the closeness of that relationship. It is far different from what it might have been ten years ago. There is a real, honest, well honest as commercial relationships can be, but there is a real desire to actually work in partnership.
Mr. W.	I don't see the relationships becoming stronger or more contractual with the competition (for space) available. Why tie yourself up on a liability that you can avoid?
Shippers' responses	
Mr. I. B.	I think the biggest change is the relationship we have with the shipping line, that we're now looking at as a partnership rather than just cost driven negotiation.
Mr. C.	But given the fact that all we're looking at is somebody that is actually physically going to carry our goods and get it there, the relationship between us and the carrier is one of almost a bus. (With reductions in the number of forwarders with which we deal) I would expect to have a stronger relationship with the ones left.

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Mr. L.	We're trying to build a long term relationship with (our chosen forwarders) and actually if we go back probably 10 years we are decreasing (the numbers with which we deal).
Mr. S.	I believe that (the relationship with the forwarder) is (becoming stronger). ...my relationship is almost totally with the forwarder. Without question, (the relationship with the forwarder is stronger). And there's a lot of trust there. I mean I would put an enormous amount of trust in their knowledge and experiences that they've had with their chosen carrier...
Mr. V-S.	(These relationships) are very strong and they are being built up with regular customers, the carriers, the freight forwarders that we use. A better relationship is being drawn up but there are more people knocking on our door looking for business.
Mr. W.	The relationship at the corporate level (between the shipper and the intermediary) is becoming stronger in terms of contractual or longer term (but) is becoming weaker at the personal level. Once they've dealt with it and it's all nice and tidy and boxed up, we don't need people so much (in order) to de-skill them and it will all go through the system mechanically.

PARAMETERS OF RELATIONSHIPS: FORMALITY/CONTRACTUAL

Between Shipper & Intermediary	
Carriers' responses	
Mr. J. ocean	Between a shipper and an intermediary it is becoming stronger, more contractual, longer term.
Mr. G. air	(The growing trend towards stronger, more formal relationships between forwarder and carrier) has created more of a partnership relationship between the freight forwarder and the manufacturer. So between the two sets of relationships they're moving more and more into the same direction.
Mr. H. multimodal	I think the services will become more contractual but I'm not quite sure they'll become contractual in the legal sense. ... I think the thing that will differ will be time, they will not necessarily be time determinated. ... We all know what we want to do and hopefully we and our customers think it's going to last 20 years... ...the spirit of the thing is that it's evergreen.
Intermediaries' responses	
Mr. B.	But the vast majority (of customer arrangements) is not by any fixed agreement whatsoever. It is basically a relationship that you strike up with somebody by persistence in selling.
Mr. H.	Typically, when looking at our industry, the relationship between the intermediary and the shipper is a long-term one based on 5 year contracts, 10 year contracts and based on defined service levels where service is more important than cost because the relationship is based on "customer intimacy". It's a very long term (referring to 5 to 10 years). As soon as you talk about asset take-over or people transfer you talk about long-term contracts because it is the only way you can justify those investments. It's a difficult question if the relationships start to become more formal. The industry still has a way to go in defining if we see the relationship being more and more based on the outsourcing of the business processes and staff functions. The industry still has a long way to go in defining the contractual relationship among business processes. .... Everybody wants it to be more formal...

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Mr. T.	some of those (logistics) contracts (with shippers) can be very profitable. The yield on that kind of business ought to be higher than traditional air freight or even ocean freight, where the yields are not very big at all, the returns are very low. If you get them right they you can earn some good money on them, but if you don't get them right they can cost you an arm and a leg. And if they start to go wrong because you're not performing to the agreed standards then they really come back and bite you because they usually fill them with all kinds of penalties.
Mr. W.	Contracts in our industry are very few and far between. So the relationships really revolve around our professional shippers and our professional forwarders and that's less dependent I think on size.
Shippers' responses	
Mr. S. B.	We don't have any contracts with our global intermediaries. We tend to use them for at least 12 months rather than on a consignment by consignment basis, and we do tend to be reasonably price sensitive, but not excessively. We change (forwarders and carriers) on an ad hoc basis. People will come in, speak to me, most of the time my mind is closed to them although I hear the rate. Occasionally someone will offer something, and usually it's something not to do with the rate, and then we start tendering.
Mr. C.	In terms of a contract (our relationships with forwarders) are informal. There's nothing saying that it starts and ends, it's ongoing, we have operational reviews on a bimonthly basis and we have a set of operating procedures that we will work to here which are agreed
Mr. L.	Nowadays we tend to look for long term contractual relationships. We have no formal contracts with any of (the forwarders). What we do have regularly is review sessions with them…
Mr. S.	(Our relationships with our forwarders) are fairly loose, but extremely important. I mean there's no formal contract signed, I fully intend to go out to tender every other year or so. I think now I'm moving away from that feeling more towards developing a longer term relationship with my chosen forwarders.
Mr. V-S.	We have formal contracts with two contractors - they are quite formal. We have formal meetings, technical review meetings, in other words we sit down with them once a quarter and we review how things are going. There is always room for improvement …

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Mr. W.	So (forwarders) have wrapped it up, their services, for a price. Then they said, 'Well we can give you a yearly contract'. And some of the big firms then put it out for contract, accountant driven probably, stupidly. They put it out and they all want quotes for it. So we've now got the growth of the forwarder into logistics. … I'm not knocking it I'm merely saying we've got to be careful what we're moving into.
Between Intermediary & Carrier	
Carriers' responses	
Mr. W. ocean	Non contractual (relationships between ourselves and forwarders) yes, (based on) trust.
Mr. G. air	I think it's been paralleled actually by the relationship between the airlines and the middle men and the middle men and the shippers, in as much as the major airlines have tried to secure some form of a contractual agreement with major freight forwarders, so that there is more of partnership, if you like, than just an agent giving an airline business as and when he chooses.
Intermediaries' responses	
Mr. H.	If you look at the relationship between us and the carrier (it) is one very much based on short-term contracts. Probably, once off or (over) months or a year. Typically based on price because we are looking for the lowest price obviously within a certain price range but we are looking for operational excellence within the right cost. I think (our relationships with carriers) have become less formal - we definitely look at it as buying a commodity so it is becoming about as formal as going to a supermarket and buying something off a shelf.
Mr. W.	There was an attempt by some major carriers to get contracts operative in the industry (but) it largely failed. There may be voluntary commitments on space, tonnage and time by some of major consolidators to some of the major carriers but in the large I consider it very much an ad hoc market.

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Between Carrier & Shipper	
Carriers' responses	
Mr. W. ocean	It's not a contracted relationship, its a long term relationship, they like us and we like them, there is trust between the two parties and there you reach a kind of relationship that's very difficult to break.
Mr. H. multimodal	I think the carriers are attempting to get a more contractual relationship. It's not the sensible answer but I think that's what they're trying to do - and failing, I think.
Shippers' responses	
Mr. I. B.	Over time this contractual element has not totally disappeared, but if you go back to the old conferences and you'd signed an agreement, you couldn't break that. If you did or you wanted dispensation you had to go and ask. Those days have gone. I think the evergreens that came along broke all that. So now we've good working relationships with suppliers of that service, we talk regularly, and we're trying to build partnerships so that we get into win win situations.
Mr. V-S.	We have formal contracts with two contractors they are quite formal... (Our present contractors) are in an unfortunate position in that they've got their fixed rates and they know and we know, of course, that we can under cut them at any time. But to a degree there's an honourable game here. They have the contract and they expect the business and, providing they meet the terms of the contract, then they get the business. It is what we call an enabling contract in that we can call upon the contract... ...(we can't turn round and say, 'This time your rates are too high, thank you very much, we're not going to use you'. So there's a degree of trust in both directions; we trust you to do the business for us and you can trust us to provide you with the business.

PARAMETERS OF RELATIONSHIPS:
NUMBER OF INTERMEDIARIES WITH WHICH A SHIPPER DEALS

	Intermediaries' responses
Mr. G.	I think more companies now are looking to deal with less organisations because of the shear cost of processing and administering the paperwork. You will still find companies who will put every single shipment out to tender. They will phone ten companies and they will use the cheapest. Now I can not imagine anything more ludicrous because they would have to save a substantial amount of money to make an equivalent of the salary of the guy who's sitting on the phone making the calls. But then you'll also find companies who go down to one (supplier).
Mr. H.	I guess there has been a decrease because the general trend in the industry is to reduce the number of service providers with whom you are working.
Mr. J.	Nobody is able to offer the whole process. Nobody is going to own everything. (As a customer) you wouldn't put all your eggs in one basket . The tendency to reduce the number of carriers or intermediaries with whom the intermediary or shipper deals has been going on for years - I don't think that is particularly (unusual).
Mr. T.	I know on our customer's side there has been a strong trend towards (dealing with) fewer forwarders, fewer logistics service providers. There's a lot of talk about the one stop shopping concept which is why our whole portfolio has broadened because our customers were saying, 'We want you to do all these things not just bits and pieces'. There was always a 80/20 role in the sense that 80% of your revenues came from 20% of your customers. I think that's shrunk even smaller now. This problem where 80% of the revenues are coming from maybe 10% of the customers. So the big customers have got bigger and that ties in with their concept of the one stop shopping and looking to have fewer suppliers themselves.

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Mr. W.	Major world companies are tending to outsource and concentrate with certain forwarders for certain areas. But there is a reluctance by shippers to have one stop shopping. I think it is vulnerability, tying everything up with one agent, and the current market place is competitive enough that it doesn't impact on the level of cost. But having said that if you move away into the middle and lower market areas, in terms of numbers of movements and volumes, an awful lot of shippers still like more than one agent or play markets or play carriers and agents against each other for price cuts. So certainly not a lesser number of forwarders - will they all share the same slice of cake is another matter?
Shippers' responses	
Mr. S. B.	About 2 ½ years ago I substantially reduced the number of carriers we were dealing with by giving a lot of work to UPS. But once that was done I felt we'd got down to the level where I didn't want us to see us reduce it any more, and I'm at the situation where I'm prepared to expand it more, but it would again be on the basis of people being able to provide the niche service, (Of) all of the companies that we're using at the moment, none of them have had the business longer than 3 years, and they've all got the business because other companies have failed.
Mr. C.	We deal with more than I would like to deal with. The first thing is, there isn't a global anything, that's my standpoint. There isn't a global freight forwarder - if there's a global freight forwarder point me in their direction. ...when you deal with fewer carriers you have greater control and if you change the terms in such a way that you're the paymaster then the carrier will start to take notice.
Mr. L.	We deal with quite a few intermediaries - about 8-10 - included in that are the courier companies as well. It's horses for courses - some are good in certain areas, some are good in certain countries and, depending on what our customers requirements are, (impacts) on what we do. I said that we're trying to build a long term relationship with these people and actually if we go back probably 10 years we are decreasing (the numbers of) them, we are consolidating to one forwarder a lot more.

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Mr. S.	I have actively tried to get (the number of forwarders) down to the minimum since taking on my present role. I'm not bothered whether I have one forwarder handling my entire business or whether I have three or four. And currently I'm only using three or four as I've just explained because it seemed to be the right thing to do the time I last negotiated. Next time I do that exercise it could be very different. I was very determined to get the numbers down, because the more you spread the business around, the less clout you have to negotiate the best rates. So the fewer that handle it the better deal you get, there's no question. Just don't divide the pie up into too many small pieces. And frankly, one of the reasons I have changed is because I like to keep my job as easy as possible. The fewer people I deal with, the simpler my job becomes. But it does have a pay off as well, and the fewer slices of the pie that you spread out the better deal you're likely to get; (however), the bigger the risk you could argue on the other side. If they turn sour, you then have to pick up the pieces. … But there are so many people out there vying for the business. I mean I've yet to find myself feeling uncomfortable as to knowing who to turn to if I find that my present carrier has let me down badly on America. I think I could find somebody fairly quickly. So yes it is changing, and I think as it changes more and more there will become fewer and fewer players in the field. There are too many forwarding agents. …
Mr. S.	Where do we start with what company, we have gone through so many companies looking for them to move things for us - carriers and freight forwarders - but now I think we've probably homed down.
Mr. W.	I'll use 4 agents, using 1 for everything. And I'm not knocking that, I'm saying, 'Lets monitor it'. So to answer your question fully, in the old days shipping partners made a choice (and spread the business around)… because what these new generation of shipping managers (hasn't faced) is strikes, real strikes.

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Carriers' responses	
Mr. J. ocean	(There is a) decrease in the number of intermediaries (used by shippers).
Mr. M. air	Absolutely, (there has been a reduction in the number of forwarders with whom a shipper works). As globalisation (increases and) as the world gets, information-wise, much smaller, it's clear that the number of forwarders is actually that a company will work with will reduce dramatically. And there are a number of examples we've been working with where companies are going from maybe 80 forwarders around the world, down to maybe 5-8, and that's a definite very very strong trend.
Mr. S. air	The shipping manager is just one person whose role has declined dramatically in large companies and he's just one part of the decision. If he was a key part of the decision role 40 years ago, he isn't now. The sales and marketing people have a view, the manufacturing people have a view, the financial people have a view. So the choice of forwarder and numbers of forwarders, that decision making process has changed within large manufacturing organisations as well. Shipping managers who really were just mangers of packing and documentation and dispatch are very much more logistics managers.
Mr. H. multimodal	But you'll get these huge players who will drive the logistics market to respond to their needs and provide logistics whether it be by road, rail, sea or air in any combination and they will seek it (however), I don't think anyone can provide it today.

PARAMETERS OF RELATIONSHIPS: NUMBER OF CARRIERS WITH WHICH AN INTERMEDIARY DEALS

		Carriers' responses
Mr. J.	ocean	There is a tendency towards the intermediary dealing with less carriers.
Mr. N.	ocean	Yes I think (there will be reductions in the number of carriers used by intermediaries). I think the options will become more limited.
Mr. G.	air	I've had a number of major freight forwarders who (have) approached (us) within the last 3 or 4 years that have said, 'We're trying to reduce our supplier list and we would like (your airline) to be in the new list'. Many freight forwarders have said to me, 'Currently we're giving business to 50 airlines and we need to reduce that to about 12 or 20 at the very outside', sometimes its difficult for them to do that of course.
Mr. M.	air	the more _____ puts into one company like (ours), the more discount they get on the whole thing. Therefore that pushes them in a certain direction. .... And as the numbers move and change and the capacities change, then I do think it forces a move in a one or other direction, which is (the forwarder using) either more carriers or less carriers .
Mr. S.	air	Forwarders want to deal with less carriers. All the big guys are saying, 'We don't want to deal with 100 carriers, we want to deal with 15 or 10'. It's not always practical from the carrier's perspective... ...forwarders recognising they want a more stable relationship with a small number of airlines. The big forwarders. The small forwarders haven't noticed anything, they just make a living. (Forwarders would) love to start talking about alliances but they recognise they can't have alliances with 15-20 carriers, they've got to play it at one step removed from an alliance.
		Intermediaries' responses
Mr. B.		In order to get the buying power and a proper focus we really need to concentrate on who (are) the carriers that we want to support. First of all, who are the good quality network carriers? You have 4 network (airlines) with an extensive network and then the industry tends to look at very good quality regional carriers.

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Mr. J.	The tendency to reduce the number of carriers or intermediaries with whom the intermediary or shipper deals has been going on for years - I don't think that is a particular -
Mr. K.	Stronger with less carriers. … So fewer, stronger.
Mr. T.	I think they probably do (deal with less carriers). I don't think there's a significant reduction. We've got as many, if not more, suppliers to manage than we had traditionally (before we began offering additional value-added services).
Mr. W.	Two or three major forwarders are trying to concentrate on half a dozen carriers and reduce the number of contractors they deal with. But by and large it's space and price that dictates (the decision) and therefore people now keep a wide portfolio of carriers in play.
Shippers' responses	
Mr. C.	(Forwarders) would definitely be using more (carriers than us). …providing (the forwarders) have got the negotiations correct, what I wouldn't want to happen is my cargo rolled over. So if we have an emergency shipment their negotiating power is such with a number of carriers that the cargo's not rolled,

CHANGES IN FUNCTIONS FOR CARRIERS

Mr. W.	ocean	The (growth in) contracts with the NVOCCs or the large freight forwarders.
Mr. M.	air	There'll be those carriers who become totally commoditised, lose any kind of control, because it's all controlled by integrators. ...And I think at the other extreme you will have a number of virtual integrators which will be combinations of airlines and forwarders working together, either (with) equity stakes or not.
Mr. S.	air	...(air) carriers examining which functions they perform in-house. They may be responsible... but whether they perform them in-house or not is something that's changing quite rapidly.
Mr.H.	multi-modal	(Carriers) are becoming a commodity, I think, to be managed.
Mr. T.	intermediary	...the introduction of qualitative standards. ...when you try and work with a customer to achieve those ends, you are entering into a longer term partnership, and you've got to have ways of measuring what you do and how you perform, and that, for us and the carriers, has been the most significant change.
Mr. W.	intermediary	You have airlines which have largely tried to retain a traditional airport to airport - some carriers have been marginally successful with door to door products trying to compete with the integrators on small traffic. Minimum traffic has ... all gone to integrators. ...traditionally I think airlines are very much what they have been for the last best part of 20 years. (With) sea freight you've tended to have a sophistication of equipment and handling methods - again it's patchy.
Mr. I. B.	shipper	I think the inability (of ocean carriers) to provide a wider service world-wide...

CHANGES IN FUNCTION FOR INTERMEDIARIES

Mr. W. ocean	There is a growing tendency in our industry to enter into service contracts with freight forwarders. If you then have a sales organisation in Europe and North America it becomes almost obsolete because the freight forwarder is then going to take over from you in selling at very competitive rates. So we are very reluctant to enter those kind of arrangements with freight forwarders.
Mr. M. air	I think (forwarders) will polarize into true global players. The globals will become globaller and I think then there will be a whole load of niche players - niche forwarders in special markets, special commodities, those kinds of things.
Mr. S. air	The extension of (the forwarder's) influence or extension of it's operational control.
Mr. H. multimodal	Potentially can be expected to take far more real responsibility
Mr. G. intermediary	I don't see much scope for (extending operations) downstream into the carrier function, I think broadly speaking the carriers are doing about all that they can do and I don't see forwarders moving that way.
Mr. W. intermediary	The forwarder has had to respond to a highly competitive market place in recent years (by) increasing innovation by leaps and bounds because they're responding to the market demand to opt out of third party subcontracting and additional services. The forwarder himself has increased his range, scope and option of services. He's doing that because of outsourcing, he's doing it because of competitive elements, he's doing it because he's identified a niche in the market place, he's doing it because most forwarders appreciate now they need to be more flexible to survive

CHANGES IN FUNCTION FOR SHIPPERS

Mr. M. air	What I see is power moving to the retailers in every retail product. And I think that has some quite crucial impacts in terms of the way the whole of manufacturing is structured and hence, the logistics.
Mr. H. multimodal	...why are they letting all these individual countries run their own distribution networks? You're not making (the product) within that country probably. So why have we got 17 warehouses in Europe? ...we've got country managers of various companies sitting in their little empires where they wish to control logistics, they've got to have their warehouse because they're frightened if they haven't got their warehouse, how are going to get their product to their customer.
Mr. G. intermediary	Although we call them shipping companies or shippers that's one of the things they do least well. They didn't set up in business to become an exporting organisation, they set up in business to design, make and sell something. Once they move outside that they've moved into areas that they don't necessarily understand and they've employed people who only understand marginally more than they do. The end result is that in the land of the blind the one eyed man is King.
Mr. I. B. shipper	We are trying to push the boundaries out to manage the supply chain. Now the things we're looking at is where we can go CIF or C&F or DDU so that we can have control, and that's our responsibility - to get the product to the customer. Over time, it's been frustrating to live using FOB terms because I really think it's a drawback and again it's historically the UK exporter selling on FOB terms.

Content Analysis of Role Descriptors by Respondent Group and by Mode of Transport

The matrix below indicates the number of lines of text that were coded to each of the industry groups for the three roles of the intermediary in the eyes of the airlines and shipping lines: customer, collaborator, and competitor. You will note that intermediaries and carriers spoke relatively more about the roles in terms of these words or their synonyms than did shippers, and carriers spoke relatively more about collaboration than did intermediaries.

RESPONDENT TYPE VERSUS CUSTOMER, COLLABORATOR & COMPETITOR

	Intermediary	Carrier	Shipper
Customer	163	150	23
Collaborator	57	147	54
Competitor	110	86	74

Another matrix was created by separating the carriers into ocean, air, and multi-modal and matching them to the same three sets of words and their synonyms:

CARRIER TYPE VERSUS CUSTOMER, COLLABORATOR & COMPETITOR

	Shipping Lines (4)	Airlines (3)	Multimodal Carrier (1)
Customer	47	74	29
Collaborator	0	141	6
Competitor	25	61	0

While appreciating that the number of carrier-respondents doesn't correspond (four ocean/three air/one multimodal) and therefore, the numbers of text units coded both to respondent group and containing the descriptor words are irrelevant, it is interesting to note that ocean carriers did not speak of *any* version of collaboration - whether it be alliance or partnership - whereas to air carriers it was dominant.

The Intermediary/Airline Dyad: A Model of Interlocking Factors

As can be seen in the figure attached there are five factors which make up this conceptual model:

1 The *freight capacity* refers to available space, industry wide, by route. With the arrival of jumbo jets carrying double the passenger load but ten times the freight load, over-capacity became the norm on many principal routes. While this may be changing on some routes, in general, the total freight capacity available exceeds that required.

2 The *status of freight* refers to the importance given to air cargo by the airline. Some passenger airlines are considered serious 'freighter' airlines while others are described as 'by-product' carriers to whom air freight is merely incidental.

3 The *level of commitment* refers to the degree of utilisation of space pre-booked by intermediaries. At present, slightly over half of all space pre-booked is utilised; the remainder must be filled by the airline over a short period of time.

4 The *customer portfolio* refers the mix of intermediary-customers desired by the airline. This mix comprises larger, long-term contractual intermediaries and smaller, ad hoc, transactional intermediaries. The larger intermediaries provide stability but with a lower yield; the smaller ones provide flexibility and a higher yield.

5 The *balance of competitor, customer, and collaborator* roles refers to the role(s) imposed on the intermediary by the carrier or taken up by the intermediary in response. The role of customer is a traditional one in a vertical supply chain. That of competitor faces many middle-men in a climate of 'disintermediation' - the contraction of the supply chain - in which the supplier of a service attempts to reach the intermediary's customer directly. Collaboration between carrier and intermediary takes on many forms but essentially arises from a mutual customer and a mutual enemy; in the case of airfreight this is the integrator.

All these factors are interrelated. The focal factor is available freight capacity which affects the other factors directly. They, in turn, affect each other directly or indirectly in conjunction with freight capacity. The following example indicates this correlation. The numbering format corresponds to that in the model:

1 As *freight capacity* over a certain route **decreases** (moving from over-capacity into under-capacity):

1.1 the *level of commitment* on the part of intermediary-customers **increases** because of the potential shortage of space resulting in a greater desire for collaboration and contractual relationships or, at the least, a greater effort to commit to PBs (permanent bookings) - to match promises with tangibles

1.2 the *status of freight* within the airline **increases** because:

1.2.1 the relative importance of cargo traffic to passenger traffic could increase and/or

1.2.2 cargo revenue could rise

1.3 the distribution of numerous, smaller customers demanding ad hoc transactions within the airline's *portfolio of customers* (on that route) **decreases** in relation to the proportion of those customers requesting longer-term, contractual arrangements. Nominally, these would be the larger intermediaries who have maintained strong ties with the carrier because of such an eventuality.

2 As the *status of freight* within the airline **increases** (i.e., the relative importance of cargo traffic to passenger traffic increases or there is an increased awareness of freight):

2.1 **increased** *freight capacity* could be made available if required, i.e., through dedicated freighter capacity, reconfiguration of existing aircraft, or outsourcing

2.2 depending on the available *freight capacity* the *balance of customer, collaborator, and competitor* could tilt away from the customer and towards the collaborator or competitor:

2.2.1 over-capacity may result in a push towards collaboration

2.2.2 under-capacity may result in a push towards competition

2.3 depending on the *freight capacity* the airline's *portfolio of customers* could be pushed towards:

2.3.1 a **lower** proportion of smaller, ad hoc customers in relation to larger, contractual customers

- in conjunction with over-capacity (leading to collaboration)

2.3.2 a **lower** proportion of larger, contractual customers in relation to smaller, ad hoc customers

- in conjunction with under-capacity (leading to competition or a customer aligned relationship)

3 As the l*evel of commitment* to match promises to actual freight tendered on the part of the intermediary-customer **increases:**

3.1 the airline's portfolio of customers will reflect this commitment through a **decrease** in the number of smaller, ad hoc

intermediaries and an **increase** in longer-term contractual arrangements

3.2 depending on the available *freight capacity,* the balance of customer, collaborator, and competitor could tilt away from the competitor and towards the collaborator or customer:

3.2.1 over-capacity may result in a push towards collaboration

3.2.2 under-capacity may result in a push towards a customer direction

3.3 the individual airline's route freight capacity could stabilise because of the enlarged 'window of opportunity' available to the airline. Indeed, as with any inventory, earlier and more accurate forecasting may result in a **decrease** in available freight capacity.

4 As the number of smaller, ad hoc intermediary-customers **decreases** in the airline's *customer portfolio*:

4.1 the *level of commitment* **increases** because the larger intermediaries that now make up an increasing proportion of the portfolio can commit to longer term and more contractual arrangements. Conversely, the associated 'buying clout' of these larger intermediaries comes with a demand for discounts dependent, again, on freight capacity:

4.1.1 over-capacity would result in demand for (and probable provision of) discounts

4.1.2 under-capacity would result in less of a discount

5 As the *balance of competitor, collaborator, and customer* roles tilts towards the role of:

5.1 customer

5.1.1 the *level of commitment* would **decrease** in conjunction with available freight capacity

- over-capacity would augment this **decrease** in the *level of commitment*
- under-capacity would not necessarily result in an **increase**

5.2 competitor

5.2.1 the *level of commitment* would **decrease** in conjunction with available freight capacity

- over-capacity would not necessarily augment this **decrease** in the level of commitment as large, contractual intermediary-customers may have long-term arrangements
- under-capacity would not necessarily result in an **increase** as intermediary-customers may not wish to commit to direct competitors

5.3 collaborator

5.3.1 the *level of commitment* would **increase** in conjunction with available freight capacity

- under-capacity would augment this **increase** in the *level of commitment*
- over-capacity would not necessarily result in a **decrease**

Route-specific capacity within the industry is the crucial element affecting buyer-seller relationships. If capacity decreases airlines might become much more aggressive in approaching shippers directly; conflict between carrier and intermediary would then develop.

In airfreight two factors have led to this 'trichotomy' - a conflicting balance of customer, competitor, or collaborator roles. First, airfreight is passenger driven. The relatively low importance given by airlines to freight has led to the wholesale outsourcing of cargo sales to the intermediary. Can and should the airlines take this back and at what cost? Second, both airlines and intermediaries face a common competitor in the integrator who has combined both the freight transport functions of the airline and the linking, co-ordinating, and knowledge functions of the intermediary. These two factors - the integrator and the low importance of freight with airlines - have led to the multi-role position of the intermediary.

The Intermediary/Shipping Line Dyad: The Customer/Competitor Dichotomy

These two factors also differentiate sea freight from airfreight. The relationship between intermediary and ocean carrier is a dichotomy in which the roles of competitor and customer clash. Collaboration with intermediaries is almost irrelevant. Shipping lines are, of course, predominantly cargo driven. Freight is all-important and consequently, cargo sales are usually kept in-house. Thus, the marketing of ocean freight services has no history of being almost completely outsourced to intermediaries. The friction created by opposing marketing efforts leads to a competitive atmosphere.

The advent of containerisation made door-to-door service simple and, more importantly to this research, easily handled directly by the shipping line. Those shippers that could fill a container could deal directly with the carrier. In addition, shipping lines may or may not sell LCL services as well as FCL. Those that do offer LCL services in conjunction with groupage may also have the facilities for other intermediary functions. This makes shipping lines with LCL services, those associated with 3PL companies, and those targeting mutual FCL shippers natural competitors to the freight forwarder. 3PL and full service LCL companies are

ocean's version of the integrator except that they are within the carrier's sphere of influence rather than competing with the carrier (see figure attached).

The role-conflict within the intermediary/shipping line dyad lies with two factors: the extent of LCL or 3PL services provided by the shipping line and the power exercised regionally by the intermediary. Those carriers with a strong presence in LCL services would look upon the intermediary as more of a competitor than the pure FCL carrier. Similarly, those shipping lines with associated 3PL divisions or companies would also consider the intermediary as more of a competitor than a customer. These LCL or 3PL carriers can offer groupage and other value-added services as traditionally provided by freight forwarders.

Regionally, intermediaries have greater power and control of the distribution channel in some countries than in others. For example, one respondent suggested freight forwarders in Italy controlled 95% of the ocean freight. The degree of control enjoyed by the intermediary would affect the roles as perceived by both parties; high intermediary power would lead to a customer role while lower power would open up the carrier to compete with the intermediary.

Therefore, the relationship between airline and intermediary can be that of collaboration against a mutual enemy, competition for the shipper-customer, or a typical vendor-customer relationship. However, the shipping line, with its own in-house forwarding services and without a common enemy, generally looks upon the intermediary as a customer when FCL is involved or the intermediary controls the market and as a competitor when LCL is dominant.

If a field is left blank it indicates that the respondent did not include that group in his role analogy.

INDIVIDUAL FEEDBACK OF ROLE ANALOGIES

	ROLE ANALOGIES BY GROUP		
Respondent	**Intermediary**	**Carrier ocean/air**	**Shipper**
Carriers			
Mr. G. air	competitor, collaborator, linking	commodity	
Mr. H. ocean	competitor, customer,	logistics provider	customer
Mr. H. multimodal	competitor, commodity,	commodity	passive
Mr. J. ocean	knowledge	commodity	dominant
Mr. M. air	competitor/ collaborator	commodity	dominant
Mr. N. ocean	customer	commodity	dominant
Mr. S. air	customer collaborator	commodity	passive
Mr. W. ocean	competitor	commodity	dominant, customer
Intermediaries			
Mr. S. B.	collaborator	collaborator, competitor	dominant
Mr. G.	obstacle customer	partner	partner
Mr. H.	co-ordinating	commodity	dominant
Mr. J.	commodity, linking	commodity, competitor,	passive
Mr. K.	collaborator, linking, knowledge	commodity	passive
Mr. T.	collaborator, co-ordinating		
Mr. W.	linking, knowledge	competitor	

Continued on following page:

INDIVIDUAL FEEDBACK OF ROLE ANALOGIES

(continued)

ROLE ANALOGIES BY GROUP

Respondent	Intermediary	Carrier ocean/air	Shipper
Shippers			
Mr. S. B.	linking	commodity	passive
Mr. I. B.	linking	partner	dominant
Mr. C.	co-ordinating	commodity	dominant
Mr. L.	commodity, linking	commodity	passive
Mr. S.	knowledge	commodity	passive
Mr. V-S.	linking knowledge	partner	dominant
Mr. W.	collaborator, linking, knowledge		

As one air respondent mentioned, playing off one air carrier against another to obtain better rates is not conducive to closer relationships. Rate negotiations on a frequent periodic basis may not allow a strong partnership to form. Because of the effort and commitment required, long-term, close alliances may only be possible between a few participants. On the one hand, intermediaries are attempting to reduce their vulnerability to potential airline under-capacity by building closer relationships with strong carriers. On the other hand, they must keep their options open by having available - and promoting to shipper-customers - a variety of carriers from which to choose.

While air carriers may hope for collaborative alliances with freight forwarders they may, at best, only be able to build ineffectual partnerships. And then only with the larger intermediaries who can balance their own capability to justify volume with each carrier/partner with the ability to maintain enough partnerships to be flexible and appease customer perceptions of variety of choice.

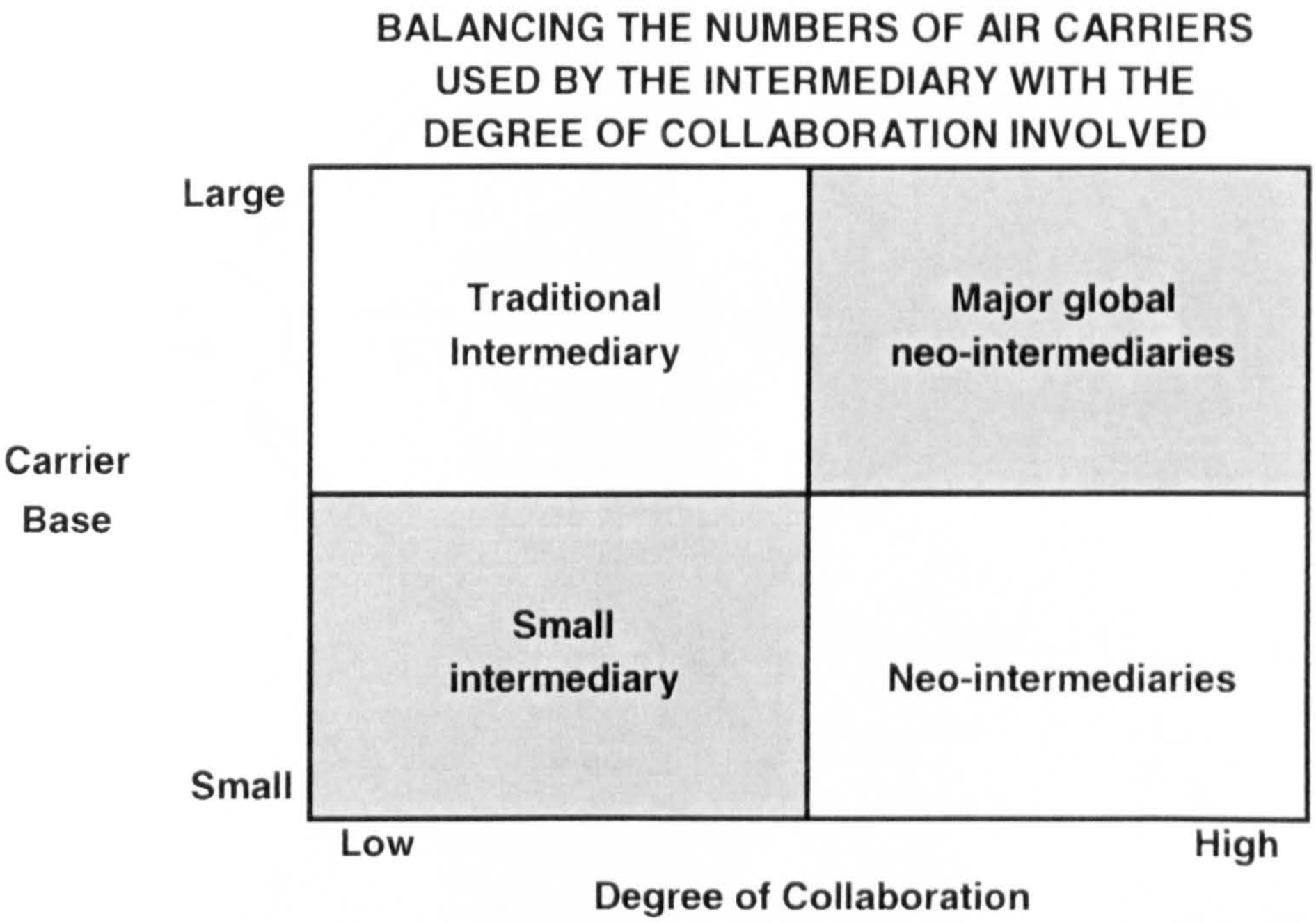
The matrix below demonstrates this premise.

BALANCING VOLUME OF FREIGHT TENDERED TO CARRIER WITH NUMBER OF CARRIER ALLIANCES MAINTAINED

High volume per carrier	**Medium intermediaries**	**Large intermediaries**
Low volume per carrier	**Small intermediaries**	**Medium intermediaries**
	Small number of alliances	**Large number of alliances**

While small intermediaries may be resigned to tendering a low volume of freight to a small number of carriers or to consolidators, medium sized intermediaries can either allocate a small amount of freight to a large number of carriers or a large amount to a select few. This is assuming that these alliances are of a similar type. If the intermediary chooses to vary the degree of collaboration he has with the carriers he may be able to maintain a larger number of carrier relationships. Traditional freight forwarders appear to retain a large base of carriers and do so with ad hoc relationships. Current global intermediaries are

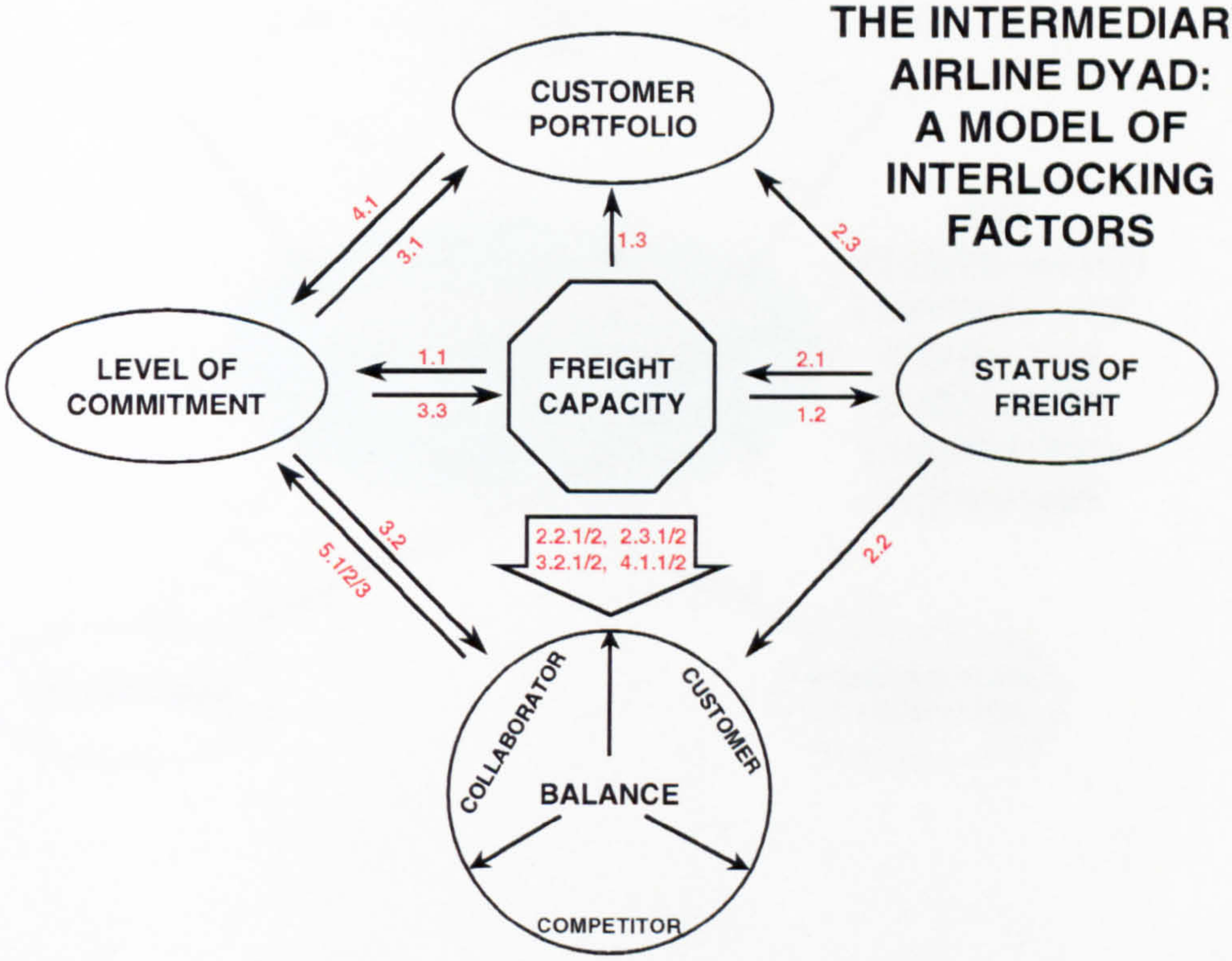
reducing that vendor base which allows them to build stronger relationships with the carriers remaining (see below).

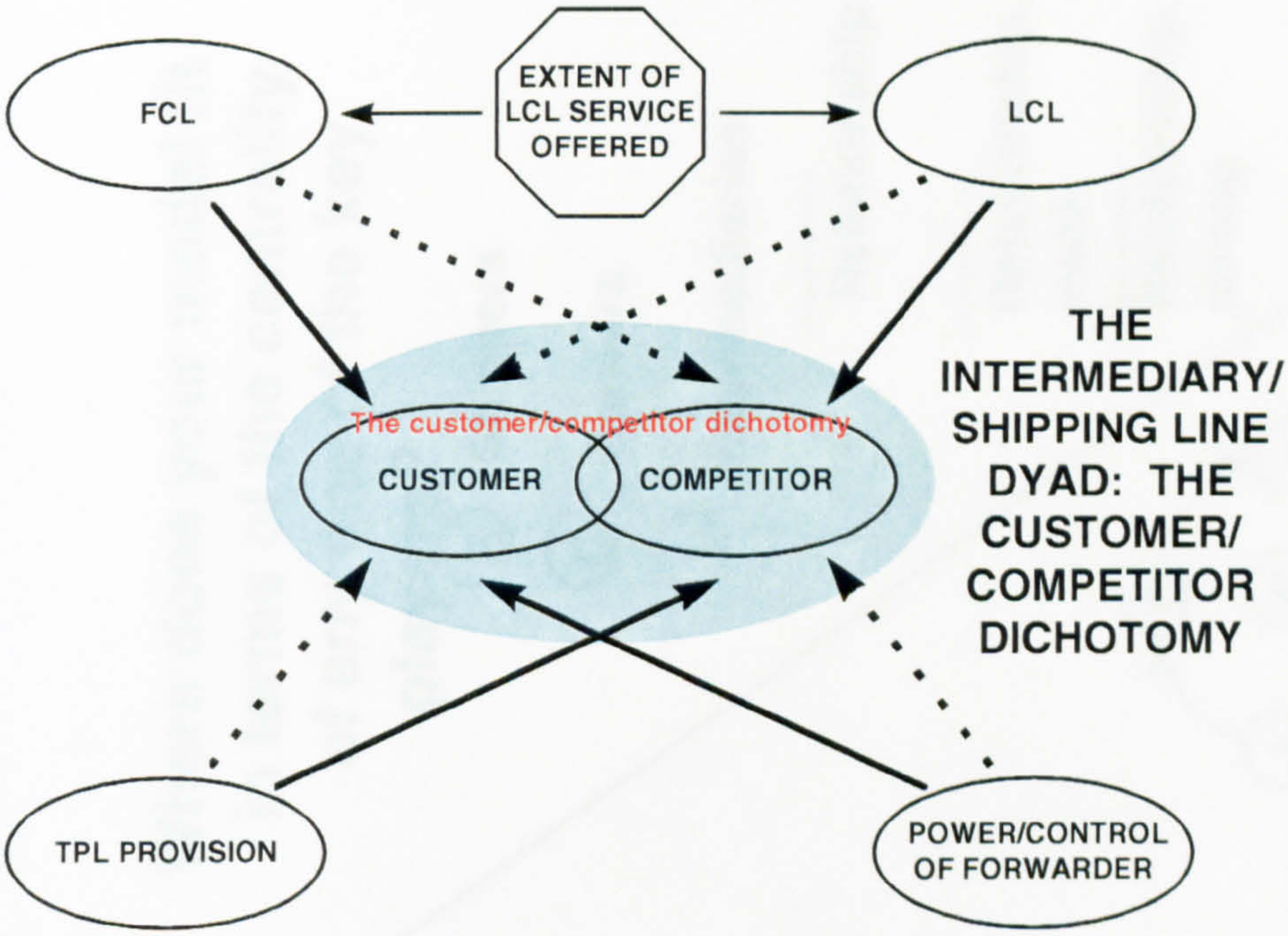


When demand for a service (freight capacity) exceeds supply of that service prices increase and relationships change. The seller no longer has to

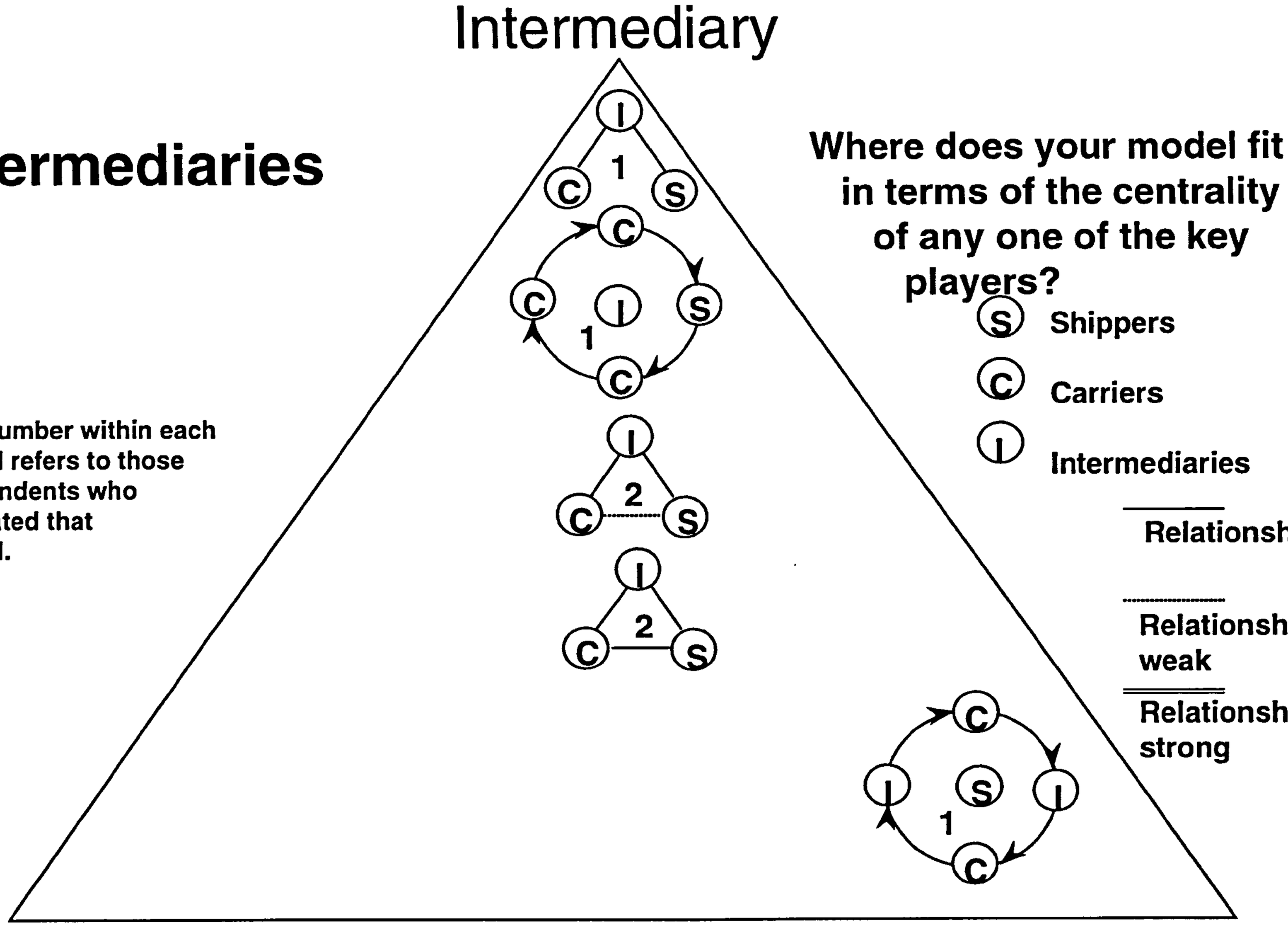
Shippers realise that access to freight capacity is all-important. In order to ensure themselves of continuous access to air freight, many shippers prefer to deal with larger intermediaries. They believe that larger intermediaries have made, in turn, greater commitments to preferred airlines. If/when capacity drops shippers believe that these commitments will guarantee their chosen intermediary freight availability and, consequently, the transport of the shippers' cargo. The shippers' insurance policy is to deal with a larger intermediary.

THE INTERMEDIARY/ AIRLINE DYAD: A MODEL OF INTERLOCKING FACTORS




FCL
EXTENT OF LCL SERVICE OFFERED
LCL
The customer/competitor dichotomy
CUSTOMER
COMPETITOR
THE INTERMEDIARY/ SHIPPING LINE DYAD: THE CUSTOMER/ COMPETITOR DICHOTOMY
TPL PROVISION
POWER/CONTROL OF FORWARDER

Intermediaries



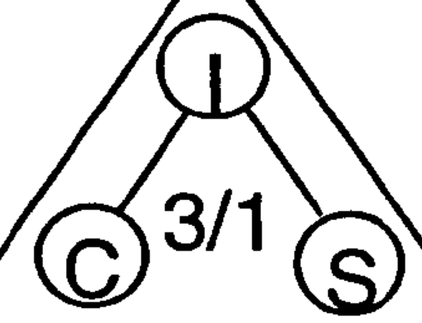
The number within each model refers to those respondents who indicated that model.

Where does your model fit in terms of the centrality of any one of the key players?

- S — Shippers
- C — Carriers
- I — Intermediaries
- ——— Relationship
- ..... Relationship, weak
- ═══ Relationship, strong

Carriers

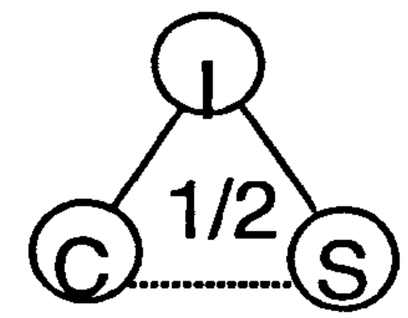
Intermediary

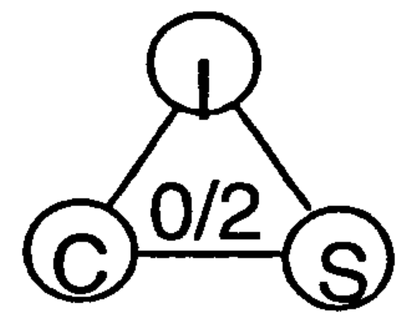


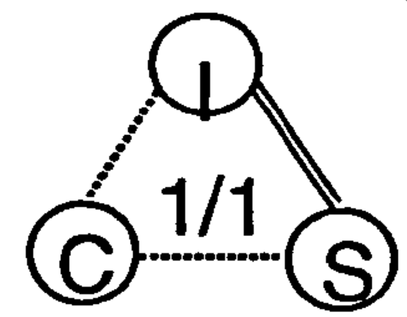
Where does your model fit in terms of the centrality of any one of the key players?

- S — Shippers
- C — Carriers
- I — Intermediaries

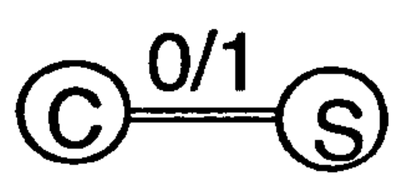
If there are two numbers within the model the first number refers to those respondents who indicated air carriers and the second number refers to those who indicated ocean.

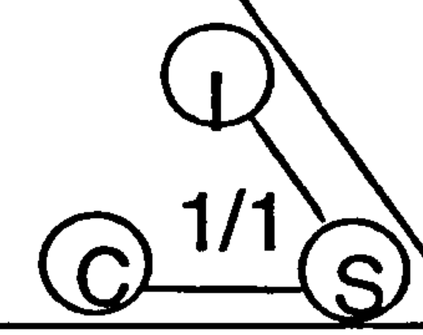






- Relationship
- Relationship, weak
- Relationship, strong



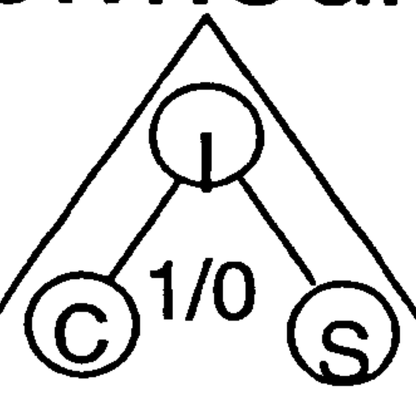


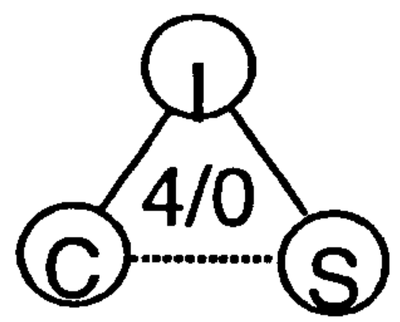
Carrier

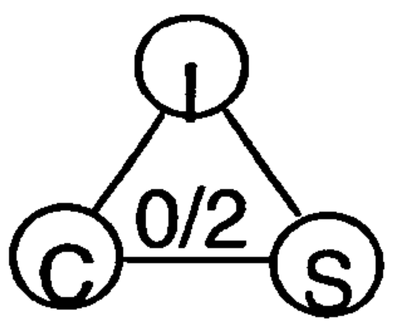
Shipper

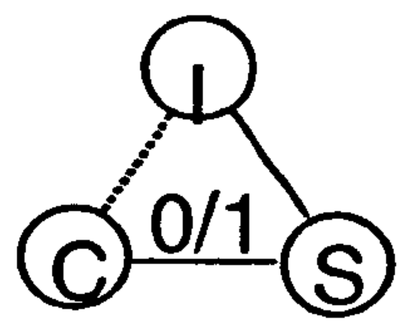
Shippers

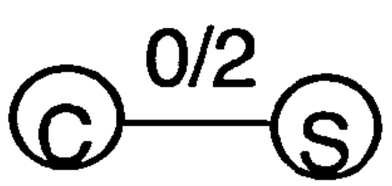
Intermediary











If there are two numbers within the model the first number refers to those respondents who indicated air carriers and the second number refers to those who indicated ocean.

Where does your model fit in terms of the centrality of any one of the key players?

S **Shippers**

C **Carriers**

I **Intermediaries**

Relationship

Relationship, weak

Relationship, strong

Carrier

Shipper

Appendix F: Survey instrument

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A TRANSACTION AND PRODUCTION COST SURVEY OF THE COMMERCIAL RELATIONSHIP BETWEEN EXPORTER, FREIGHT FORWARDER, AND AIRLINE IN GLOBAL AIR FREIGHT

Cranfield Centre for Logistics & Transportation
Cranfield School of Management

HOW TO COMPLETE THIS QUESTIONNAIRE

The purpose of this questionnaire is to discover exporters' perceptions of the costs of transacting with freight forwarders and with airlines and the cost advantages one of these freight suppliers may have over the other. As a manager, this questionnaire is asking you to reply with your organisation's perceptions of these costs rather than your own personal view.

For every completed questionnaire I receive I will contribute £1 to charity. Please indicate to which of the following charities you would like this donation sent:

☐ **Oxfam** ☐ **Save the Children** ☐ **Age Concern** ☐ **Imperial Cancer Research Fund**

The questionnaire is divided into three parts:

Part 1: The development and maintenance of associations between exporter, air freight forwarder, and airline

Part 2: The cost advantages, if any, of the air freight forwarder or airline

Part 3: Your organisation's exporting performance

Most questions can be answered by simply circling figures or ticking boxes. I estimate completing this questionnaire will take less than 15 minutes. A self-addressed stamped envelope is enclosed in which to return the completed questionnaire.

In order to standardise replies the following terms are defined:

1. ***organisation*** - the business unit for which you are responsible for the export freight. This could be a group, firm or a division thereof
2. ***shipment*** - the unit of freight which comprises one transaction with the air freight supplier. A shipment consists of one or more packages usually shipped together and at the same time
3. ***airline*** - an air carrier such as BA, KLM, or American which normally carries both passengers and freight.
4. ***air freight forwarder*** - a third party air carrier such as LEP, Kheune & Nagel, or MSAS which normally moves air freight using a variety of airlines or other air carriers.
5. ***integrator*** - an air carrier such as Federal Express or DHL which normally carries express shipments on its own planes.
6. ***other third party air carriers*** - e.g. couriers or TPL (Third Party Logistics) companies which normally move air freight using a variety of airlines or other air carriers.

There are no RIGHT or WRONG answers. Please, do not leave any items unanswered.

Please return this questionnaire by October 31, 1998

PLEDGE OF CONFIDENTIALITY

Information will not be presented in any way that would identify any individual or organisation.

THANK YOU FOR YOUR PARTICIPATION

Richard Ford (doctoral student)
Cranfield Centre for Logistics and Transportation

If you have any questions or comments about the questionnaire or any of the items please contact Richard Ford (01234-751122 x3192; fax: 01234-751806 or e-mail: *r.ford@cranfield.ac.uk*)

THE DEVELOPMENT AND MAINTENANCE OF ASSOCIATIONS BETWEEN EXPORTER, AIR FREIGHT FORWARDER, AND AIRLINE

This section discusses issues in finding, establishing and maintaining a working relationship with an air freight forwarder or an airline. We want to measure the amount of effort and costs that would be required to find, set up and maintain such an association.

Please read the statements in each section carefully. For each statement circle the number which most represents your feelings about the statement. If you strongly agree with the statement circle **3** and if you strongly disagree circle **–3**. Similarly, if you moderately or slightly agree with the statement circle **2** or **1** and if you moderately or slightly disagree circle **–2** or **–1**. If you are neutral about the statement circle **0**. Try to be as spontaneous as possible: there are no right or wrong answers. Try to use the whole scale.

If your organisation does not use one of these air freight suppliers please still complete all parts; your answers will help the comparative analysis. Indicate your *perception* of the costs of such an association if it were to occur.

A	**IN SEARCHING FOR AND EVALUATING AIR FREIGHT FORWARDERS:**	**Strongly Agree**			**Neutral**			**Strongly Disagree**
1	It would be easy to find an air freight forwarder able to <u>fully</u> satisfy our requirements	3	2	1	0	-1	-2	-3
2	It would be costly, in terms of time and effort, to screen the proposals from potential air freight forwarders	3	2	1	0	-1	-2	-3
3	It would be simple to communicate our needs to potential air freight forwarders and to receive appropriate information from them	3	2	1	0	-1	-2	-3
4	It would be difficult to evaluate potential air freight forwarders in order to make an appropriate choice	3	2	1	0	-1	-2	-3

B	**IN SEARCHING FOR AND EVALUATING AIRLINES:**	**Strongly Agree**			**Neutral**			**Strongly Disagree**
1	It would be easy to find an airline able to <u>fully</u> satisfy our requirements	3	2	1	0	-1	-2	-3
2	It would be costly, in terms of time and effort, to screen the proposals from potential airlines	3	2	1	0	-1	-2	-3
3	It would be simple to communicate our needs to potential airlines and to receive appropriate information from them	3	2	1	0	-1	-2	-3
4	It would be difficult to evaluate potential airlines in order to make an appropriate choice	3	2	1	0	-1	-2	-3

C	**IN DEVELOPING AN ASSOCIATION WITH AN AIR FREIGHT FORWARDER:**	**Strongly Agree**			**Neutral**			**Strongly Disagree**
1	The procedures that would be followed in dealing with an air freight forwarder would be clear in advance	3	2	1	0	-1	-2	-3
2	Significant effort would be required to gather the information necessary to outline the working relationship with an air freight forwarder	3	2	1	0	-1	-2	-3
3	It would be straightforward and easy to work out the main issues and necessary details of our association with an air freight forwarder	3	2	1	0	-1	-2	-3
4	A lot of unspecified issues would need to be worked out as the association with an air freight forwarder develops	3	2	1	0	-1	-2	-3
5	It would require significant effort to determine individual roles to be performed by our organisation and an air freight forwarder	3	2	1	0	-1	-2	-3

D	IN DEVELOPING AN ASSOCIATION WITH AN AIRLINE:	Strongly Agree			Neutral		Strongly Disagree
1	The procedures that would be followed in dealing with an airline would be clear in advance	3	2	1	0	-1	-2	-3
2	Significant effort would be required to gather the information necessary to outline the working relationship with an airline	3	2	1	0	-1	-2	-3
3	It would be straightforward and easy to work out the main issues and necessary details of our association with an airline	3	2	1	0	-1	-2	-3
4	A lot of unspecified issues would need to be worked out as the association with an airline develops	3	2	1	0	-1	-2	-3
5	It would require significant effort to determine individual roles to be performed by our organisation and an airline	3	2	1	0	-1	-2	-3

E	IN MONITORING THE PERFORMANCE OF AN AIR FREIGHT FORWARDER:	Strongly Agree			Neutral		Strongly Disagree
1	It would be easy to tell if we were receiving fair treatment from an air freight forwarder	3	2	1	0	-1	-2	-3
2	It would take significant effort to detect whether or not an air freight forwarder met the agreed delivery and quality requirements	3	2	1	0	-1	-2	-3
3	It would be simple and inexpensive, in time and effort, to collect performance data from a chosen air freight forwarder	3	2	1	0	-1	-2	-3
4	We would be concerned about an air freight forwarder taking advantage of our relationship	3	2	1	0	-1	-2	-3
5	Accurately evaluating the performance of a chosen air freight forwarder would require considerable effort	3	2	1	0	-1	-2	-3
6	It would be simple to compare the performance of a chosen air freight forwarder with its competitors	3	2	1	0	-1	-2	-3

F	IN MONITORING THE PERFORMANCE OF AN AIRLINE:	Strongly Agree			Neutral		Strongly Disagree
1	It would be easy to tell if we were receiving fair treatment from an airline	3	2	1	0	-1	-2	-3
2	It would take significant effort to detect whether or not an airline met the agreed delivery and quality requirements	3	2	1	0	-1	-2	-3
3	It would be simple and inexpensive, in time and effort, to collect performance data from a chosen airline	3	2	1	0	-1	-2	-3
4	We would be concerned about an airline taking advantage of our relationship	3	2	1	0	-1	-2	-3
5	Accurately evaluating the performance of a chosen airline would require considerable effort	3	2	1	0	-1	-2	-3
6	It would be simple to compare the performance of a chosen airline with its competitors	3	2	1	0	-1	-2	-3

G	IN ADDRESSING PROBLEMS THAT MIGHT ARISE IN YOUR ASSOCIATION WITH AN AIR FREIGHT FORWARDER:	Strongly Agree			Neutral		Strongly Disagree
1	Prior to starting an association, there would exist standard solutions or approaches to problems that might occur with an air freight forwarder	3	2	1	0	-1	-2	-3
2	Problem-solving would often be challenging, due to the nature of the service	3	2	1	0	-1	-2	-3
3	Although solutions to problems can be achieved, they would often need to be highly customised	3	2	1	0	-1	-2	-3

H	IN ADDRESSING PROBLEMS THAT MIGHT ARISE IN YOUR ASSOCIATION WITH AN AIRLINE:	Strongly Agree			Neutral		Strongly Disagree
1	Prior to starting an association, there would exist standard solutions or approaches to problems that might occur with an airline	3	2	1	0	-1	-2	-3
2	Problem-solving would often be challenging, due to the nature of the service	3	2	1	0	-1	-2	-3
3	Although solutions to problems can be achieved, they would often need to be highly customised	3	2	1	0	-1	-2	-3

J	CONCERNING THE LIKELIHOOD OF AN AIR FREIGHT FORWARDER TAKING ADVANTAGE OF ITS ASSOCIATION WITH YOUR COMPANY:	Strongly Agree			Neutral		Strongly Disagree
1	There would be no incentive for an air freight forwarder to pursue its interests at the expense of our company's interests	3	2	1	0	-1	-2	-3
2	It would be easy for an air freight forwarder to alter the facts in order to exploit the relationship	3	2	1	0	-1	-2	-3
3	It would be very difficult for an air freight forwarder to promise to do things without actually doing them later	3	2	1	0	-1	-2	-3
4	There would exist, from the air freight forwarder's perspective, a significant motivation to take advantage of unspecified or unenforceable contract terms	3	2	1	0	-1	-2	-3

K	CONCERNING THE LIKELIHOOD OF AN AIRLINE TAKING ADVANTAGE OF ITS ASSOCIATION WITH YOUR COMPANY:	Strongly Agree			Neutral		Strongly Disagree
1	There would be no incentive for an airline to pursue its interests at the expense of our company's interests	3	2	1	0	-1	-2	-3
2	It would be easy for an airline to alter the facts in order to exploit the relationship	3	2	1	0	-1	-2	-3
3	It would be very difficult for an airline to promise to do things without actually doing them later	3	2	1	0	-1	-2	-3
4	There would exist, from the airline's perspective, a significant motivation to take advantage of unspecified or unenforceable contract terms	3	2	1	0	-1	-2	-3

THE COST ADVANTAGES OF THE AIR FREIGHT FORWARDER OR AIRLINE

This section discusses issues concerning the cost advantages, if any, that the airline or air freight forwarder may have over the other. These cost advantages are derived from economies of scale or scope that one party may have. Lower costs for the seller may (or may not) result in lower prices paid by the buyer. We want your opinion about which of the two parties has the cost advantage, if any, over the other and the degree of that advantage for each of the following services.

For each service for which you feel the air freight forwarder has a very strong cost advantage circle **3** on the left side of the scale. If you feel the airline has a very strong cost advantage circle **3** on the right side of the scale. For each service for which you feel the air freight forwarder has a moderate cost advantage circle **2** on the left side of the scale. If you feel the airline has a moderate cost advantage circle **2** on the right side of the scale. For each service for which you feel one participant has only a small advantage over the other circle **1** on the side of the participant with that advantage. Finally, for those costs in which neither participant has a clear advantage, circle **0.**

Again, try to be as spontaneous as possible: there are no right or wrong answers. Try to use the whole scale.

If your organisation does not use one of these air freight suppliers please still complete all questions; your answers will help the comparative analysis. Indicate your *perception* of the comparative cost advantage between both air freight suppliers.

L **WHICH PARTICIPANT DO YOU BELIEVE HAS THE LOW COST ADVANTAGE FOR EACH OF THESE SERVICES AND BY HOW MUCH?**	**Air Freight Forwarder**			**Neutral**			**Airline**
1 Freight consolidation:	3	2	1	0	1	2	3
2 Documentation preparation and related trade services:	3	2	1	0	1	2	3
3 Information handling through information systems:	3	2	1	0	1	2	3
4 Collection and payment of moneys for products and services:	3	2	1	0	1	2	3
5 Provision of value-added services:	3	2	1	0	1	2	3
6 Provision of door-to-door freight movement:	3	2	1	0	1	2	3
7 Provision of extensive geographical coverage:	3	2	1	0	1	2	3

YOUR ORGANISATION'S EXPORTING PERFORMANCE

This section discusses the modes of global transport used by your organisation, the regions to which you export, and the importance of and your experience with global exporting outside of Europe. In addition, this section asks about your use of air freight forwarders and airlines and the numbers of air freight suppliers you use. Because of the "domestic" implications of the EU I would like you to answer these questions (except where noted) based only on your trade **outside** of Europe. Please complete all questions.

M

1	Approximately, how many *shipments* were exported world-wide by your organisation over the past 12 months? A "*shipment*" is defined as one or more packages shipped together and comprising a single transaction with the freight forwarder or carrier	☐ less than 100 shipments ☐ 100 to 500 ☐ 500 to 2000 ☐ 2000 to 5000 ☐ over 5000
2	Approximately, what percentage of your organisation's total sales revenue was due to export sales world-wide over the past 12 months?	_____%
3	**Excluding Europe**, please rank the trading regions to which you exported goods over the past 12 months (in terms of number of shipments). Indicate '**1**' for the trading region to which you exported the greatest number of shipments. Only rank those trading regions to which you exported goods.	Africa _____ Asia _____ Australia/NZ _____ North America _____ South America _____
4	**Excluding Europe**, approximately how many *consignees* or recipients of your products are there in your most important trading region? "*Consignees*" are your customers extended by the number of their locations to which you export their shipments (i.e., customer destinations)	☐ less than 5 consignees ☐ 6 to 10 ☐ 11 to 20 ☐ 21 to 30 ☐ over 30
5	Of the shipments (excluding documentation and mail) exported by your organisation to trading regions **other than Europe** over the past 12 months approximately what percentage was shipped by each of the transportation modes indicated?	Air _____% Ocean _____% Road _____% Rail _____% Other_____ _____% Total 100%
6	Of the shipments exported **by air** by your organisation (excluding documentation and mail) to trading regions **other than Europe** over the past 12 months approximately what percentage was shipped by dealing directly with each of the following types of air freight suppliers?	Airline _____% Freight forwarder _____% Integrator/courier _____% Other (describe) _____% _____ Total 100%

7 Please indicate which **single** air freight supplier transports the largest percentage of your shipments by air to your most important trading region **excluding Europe**.	☐ airline ☐ air freight forwarder ☐ integrator ☐ other (describe) _____
8 Approximately what percentage of your shipments **by air** to your most important trading region is transported by this **single** air freight supplier as described in Question 7?	☐ less than 20% ☐ 20% to 40% ☐ 41% to 60% ☐ 61% to 80% ☐ over 80%
9 Please indicate the number of airfreight forwarders with whom you deal on a regular basis for your shipments **by air**. "Regular" means twelve or more transactions over the past 12 months. If you do not regularly deal with any air freight forwarders mark the box labelled "0".	☐ 0 air freight forwarders ☐ 1 ☐ 2 ☐ 3-5 ☐ over 5
10 Please indicate the number of airlines with whom you deal on a regular basis for your shipments **by air**. "Regular" means twelve or more transactions over the past 12 months. If you do not deal directly with any airlines mark the box labelled "0".	☐ 0 airlines ☐ 1 ☐ 2 ☐ 3-5 ☐ over 5
11 In years, please indicate approximately your organisation's experience with exporting to regions **outside of Europe.**	☐ less than 1 year ☐ 1 to 5 years ☐ 5 to 10 years ☐ 10 to 50 years ☐ over 50 years
12 For your **non-European air exports** please rank the terms of trade normally used over the last 12 months. Indicate '**1**' for the trading term used in the greatest number of transactions. Only rank those terms of trade normally used. Ex-works: those terms in which no freight charges paid by sender. F-terms: those terms in which main freight charges not paid by sender (i.e., FOB, FCA) C-terms: those terms in which main freight charges paid by sender (i.e., CIF, CFR, CPT, C&F) D-terms: those terms in which all freight charges paid by sender (i.e., DDU/P)	Ex-works _____ F-terms _____ C-terms _____ D-terms _____ Others (describe) _____ _____ _____ _____

If you have any comments, please write them on the following page.

Thank you for completing this questionnaire.

PLEDGE OF CONFIDENTIALITY

Information will not be presented in any way that would identify any individual or organisation.

PLEASE RETURN IT TO ME IN THE ENCLOSED STAMPED, SELF-ADDRESSED ENVELOPE.

Comments:

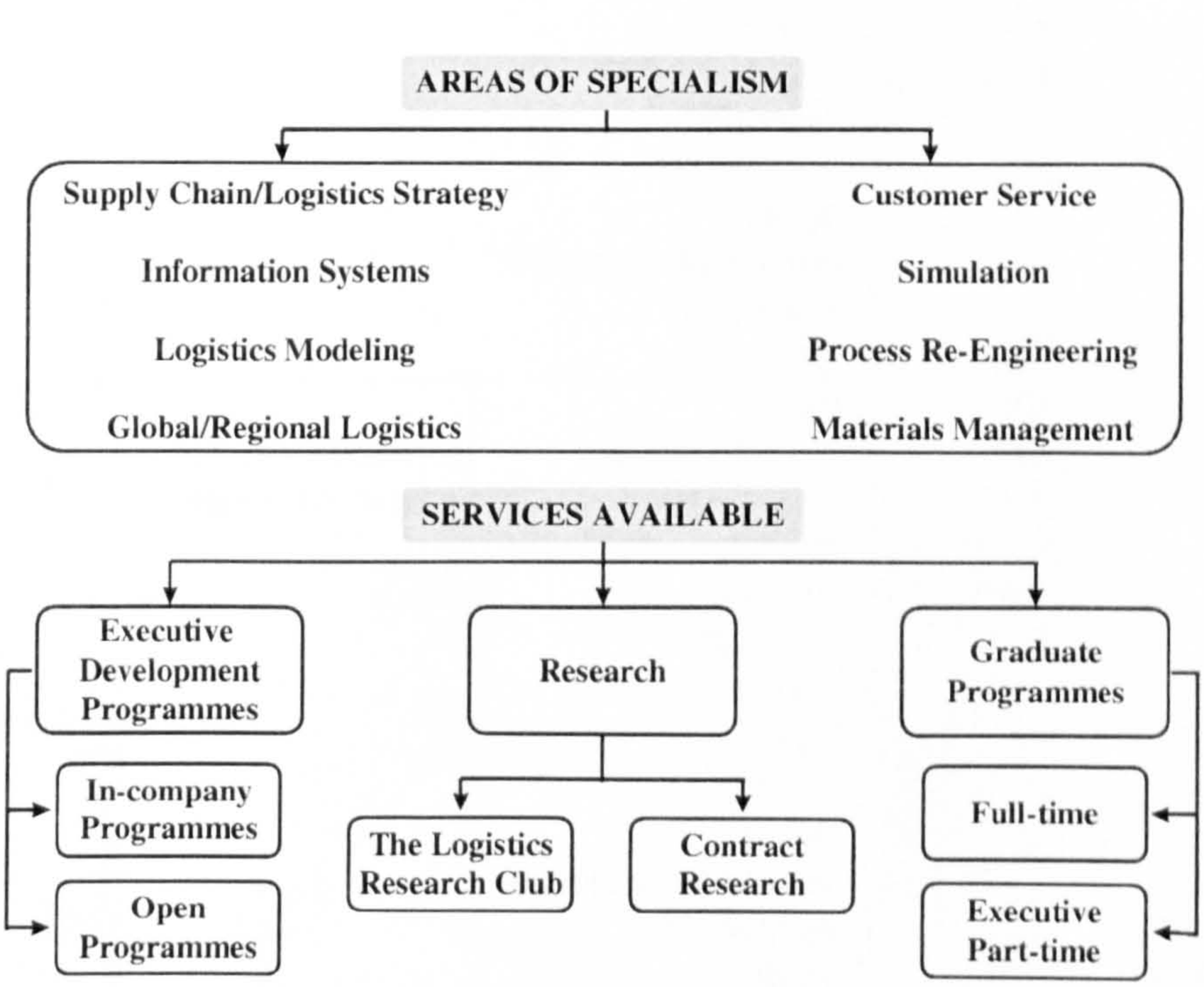
THE CRANFIELD CENTRE FOR LOGISTICS AND TRANSPORTATION

Chairman: Professor Martin Christopher

Director: Alan Waller

The Cranfield Centre for Logistics and Transportation (CCLT) is Europe's largest faculty specialising in the management of logistics and transportation. As a major centre of excellence, CCLT provides a resource which encompasses taught programmes for graduates and executives, research and development capabilities, and a continuing commitment to the dissemination of ideas and knowledge through publications and symposia.

The activities of CCLT are driven by an understanding of the complex and far-reaching underlying issues involved in planning and managing logistics and transport systems, the development of responses to these issues, and the translation of this body of knowledge into developing and fostering skills in the managers of today and tomorrow.



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Appendix G (1)

TRANSACTION COST ITEM DIFFERENCE (Section 1)

			Statistic	Std. Error
Search Item 1 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	1.93	.15
		Lower bound	1.64	
		Upper bound	2.23	
		5% Trimmed Mean	1.96	
		Median	2.00	
		Variance	3.904	
		Std. Deviation	1.98	
		Minimum	-3	
		Maximum	6	
		Range	9	
		Interquartile Range	4.00	
		Skewness	.024	.183
		Kurtosis	-.612	.364
Search Item 2 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	.24	.11
		Lower bound	2.71E-02	
		Upper bound	.45	
		5% Trimmed Mean	.24	
		Median	.00	
		Variance	2.023	
		Std. Deviation	1.42	
		Minimum	-5	
		Maximum	5	
		Range	10	
		Interquartile Range	1.00	
		Skewness	.089	.183
		Kurtosis	2.562	.364
Search Item 3 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	1.22	.13
		Lower bound	.96	
		Upper bound	1.47	
		5% Trimmed Mean	1.15	
		Median	1.00	
		Variance	3.005	
		Std. Deviation	1.73	
		Minimum	-3	
		Maximum	6	
		Range	9	
		Interquartile Range	2.00	
		Skewness	.721	.183
		Kurtosis	-.140	.364

Search Item 4 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	.67	.13
		Lower bound	.41	
		Upper bound	.93	
		5% Trimmed Mean	.64	
		Median	.00	
		Variance	3.114	
		Std. Deviation	1.76	
		Minimum	-4	
		Maximum	6	
		Range	10	
		Interquartile Range	1.00	
		Skewness	.575	.183
		Kurtosis	1.379	.364
Development Item 1 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	1.14	.14
		Lower bound	.87	
		Upper bound	1.41	
		5% Trimmed Mean	1.08	
		Median	1.00	
		Variance	3.314	
		Std. Deviation	1.82	
		Minimum	-3	
		Maximum	6	
		Range	9	
		Interquartile Range	2.00	
		Skewness	.627	.184
		Kurtosis	.464	.365
Development Item 2 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	.94	.12
		Lower bound	.69	
		Upper bound	1.18	
		5% Trimmed Mean	.88	
		Median	1.00	
		Variance	2.688	
		Std. Deviation	1.64	
		Minimum	-3	
		Maximum	6	
		Range	9	
		Interquartile Range	2.00	
		Skewness	.676	.183
		Kurtosis	.486	.364

Development Item 3 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	1.59	.15
		Lower bound	1.30	
		Upper bound	1.87	
		5% Trimmed Mean	1.56	
		Median	1.00	
		Variance	3.764	
		Std. Deviation	1.94	
		Minimum	-5	
		Maximum	6	
		Range	11	
		Interquartile Range	3.00	
		Skewness	.188	.183
		Kurtosis	.014	.364
Development Item 4 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	.74	.12
		Lower bound	.52	
		Upper bound	.97	
		5% Trimmed Mean	.69	
		Median	.00	
		Variance	2.319	
		Std. Deviation	1.52	
		Minimum	-3	
		Maximum	6	
		Range	9	
		Interquartile Range	2.00	
		Skewness	.680	.184
		Kurtosis	1.152	.365
Development Item 5 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	1.10	.15
		Lower bound	.81	
		Upper bound	1.39	
		5% Trimmed Mean	1.04	
		Median	.00	
		Variance	3.707	
		Std. Deviation	1.93	
		Minimum	-4	
		Maximum	6	
		Range	10	
		Interquartile Range	2.00	
		Skewness	.622	.184
		Kurtosis	.390	.366

Monitor Item 1 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	1.36	.15
		Lower bound	1.07	
		Upper bound	1.66	
		5% Trimmed Mean	1.29	
		Median	1.00	
		Variance	4.004	
		Std. Deviation	2.00	
		Minimum	-4	
		Maximum	6	
		Range	10	
		Interquartile Range	3.00	
		Skewness	.657	.183
		Kurtosis	-.037	.364
Monitor Item 2 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	.87	.14
		Lower bound	.59	
		Upper bound	1.16	
		5% Trimmed Mean	.82	
		Median	.00	
		Variance	3.547	
		Std. Deviation	1.88	
		Minimum	-3	
		Maximum	6	
		Range	9	
		Interquartile Range	2.00	
		Skewness	.701	.184
		Kurtosis	.405	.365
Monitor Item 3 (forwarder minus airline score)	95% Confidence Interval for Mean	Mean	.76	.14
		Lower bound	.49	
		Upper bound	1.04	
		5% Trimmed Mean	.73	
		Median	.00	
		Variance	3.428	
		Std. Deviation	1.85	
		Minimum	-6	
		Maximum	6	
		Range	12	
		Interquartile Range	2.00	
		Skewness	.273	.183
		Kurtosis	1.274	.364

Monitor Item 4 (forwarder minus airline score)		Mean	.36	.12
	95% Confidence Interval for Mean	Lower bound	.12	
		Upper bound	.60	
		5% Trimmed Mean	.35	
		Median	.00	
		Variance	2.485	
		Std. Deviation	1.58	
		Minimum	-6	
		Maximum	6	
		Range	12	
		Interquartile Range	1.00	
		Skewness	.163	.184
		Kurtosis	2.330	.365
Monitor Item 5 (forwarder minus airline score)		Mean	.66	.14
	95% Confidence Interval for Mean	Lower bound	.38	
		Upper bound	.94	
		5% Trimmed Mean	.64	
		Median	.00	
		Variance	3.529	
		Std. Deviation	1.88	
		Minimum	-5	
		Maximum	6	
		Range	11	
		Interquartile Range	1.00	
		Skewness	.426	.183
		Kurtosis	1.413	.364
Monitor Item 6 (forwarder minus airline score)		Mean	.74	.15
	95% Confidence Interval for Mean	Lower bound	.46	
		Upper bound	1.03	
		5% Trimmed Mean	.72	
		Median	.00	
		Variance	3.780	
		Std. Deviation	1.94	
		Minimum	-6	
		Maximum	6	
		Range	12	
		Interquartile Range	2.00	
		Skewness	.187	.183
		Kurtosis	1.490	.364

Problem Item 1 (forwarder minus airline score)		Mean	.47	.12
	95% Confidence Interval for Mean	Lower bound	.24	
		Upper bound	.71	
		5% Trimmed Mean	.34	
		Median	.00	
		Variance	2.525	
		Std. Deviation	1.59	
		Minimum	-4	
		Maximum	6	
		Range	10	
		Interquartile Range	1.00	
		Skewness	1.561	.183
		Kurtosis	4.026	.364
Problem Item 2 (forwarder minus airline score)		Mean	.80	.11
	95% Confidence Interval for Mean	Lower bound	.57	
		Upper bound	1.02	
		5% Trimmed Mean	.68	
		Median	.00	
		Variance	2.221	
		Std. Deviation	1.49	
		Minimum	-2	
		Maximum	6	
		Range	8	
		Interquartile Range	1.00	
		Skewness	1.478	.183
		Kurtosis	2.179	.364
Problem Item 3 (forwarder minus airline score)		Mean	.55	.11
	95% Confidence Interval for Mean	Lower bound	.33	
		Upper bound	.76	
		5% Trimmed Mean	.48	
		Median	.00	
		Variance	2.055	
		Std. Deviation	1.43	
		Minimum	-3	
		Maximum	6	
		Range	9	
		Interquartile Range	1.00	
		Skewness	1.120	.183
		Kurtosis	2.522	.364

Opportunism Item 1 (forwarder minus airline score)		Mean	.38	.11
	95% Confidence Interval for Mean	Lower bound	.17	
		Upper bound	.59	
		5% Trimmed Mean	.31	
		Median	.00	
		Variance	1.997	
		Std. Deviation	1.41	
		Minimum	-3	
		Maximum	6	
		Range	9	
		Interquartile Range	1.00	
		Skewness	1.094	.183
		Kurtosis	2.354	.364
Opportunism Item 2 (forwarder minus airline score)		Mean	.28	.12
	95% Confidence Interval for Mean	Lower bound	3.53E-02	
		Upper bound	.52	
		5% Trimmed Mean	.26	
		Median	.00	
		Variance	2.671	
		Std. Deviation	1.63	
		Minimum	-6	
		Maximum	6	
		Range	12	
		Interquartile Range	1.00	
		Skewness	.202	.183
		Kurtosis	2.507	.364
Opportunism Item 3 (forwarder minus airline score)		Mean	.42	.14
	95% Confidence Interval for Mean	Lower bound	.15	
		Upper bound	.69	
		5% Trimmed Mean	.44	
		Median	.00	
		Variance	3.251	
		Std. Deviation	1.80	
		Minimum	-6	
		Maximum	6	
		Range	12	
		Interquartile Range	1.00	
		Skewness	-.145	.183
		Kurtosis	2.836	.364

Opportunism Item 4 (forwarder minus airline score)	Mean	.43	9.42E-02
	95% Confidence Interval for Mean — Lower bound	.24	
	95% Confidence Interval for Mean — Upper bound	.61	
	5% Trimmed Mean	.34	
	Median	.00	
	Variance	1.560	
	Std. Deviation	1.25	
	Minimum	-3	
	Maximum	5	
	Range	8	
	Interquartile Range	1.00	
	Skewness	1.371	.183
	Kurtosis	2.938	.364

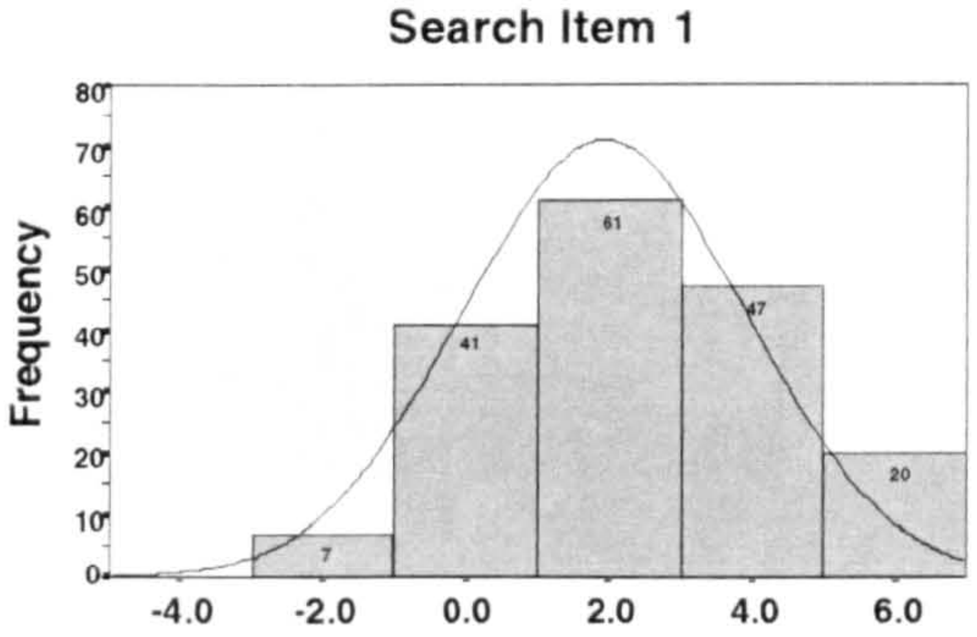
Appendix G (2)

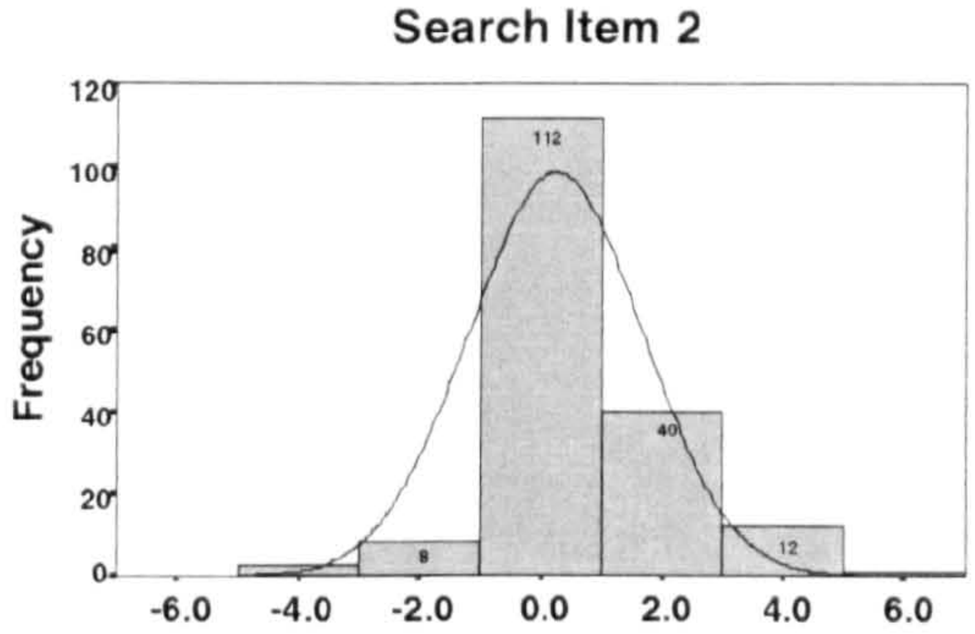
Histograms of differences (based on Forwarder scores minus Airline scores)

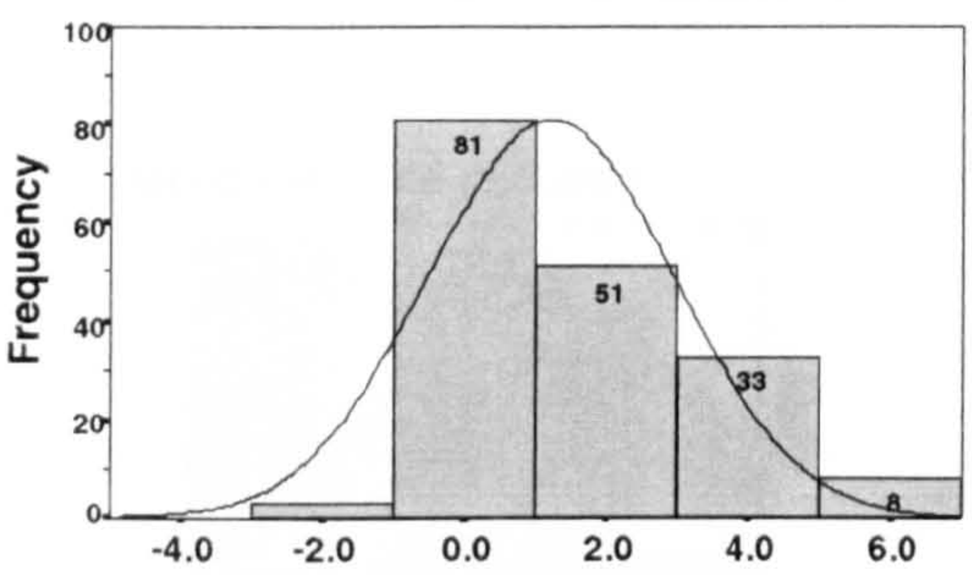
Positive values indicate shipper perception of forwarder as offering lower transaction costs.

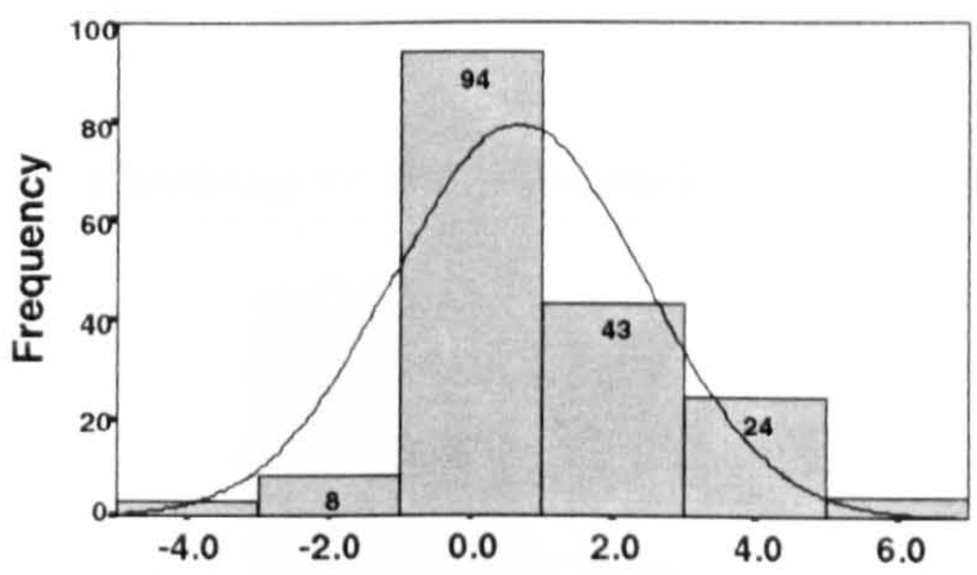
N = 176

Histograms of Search Items

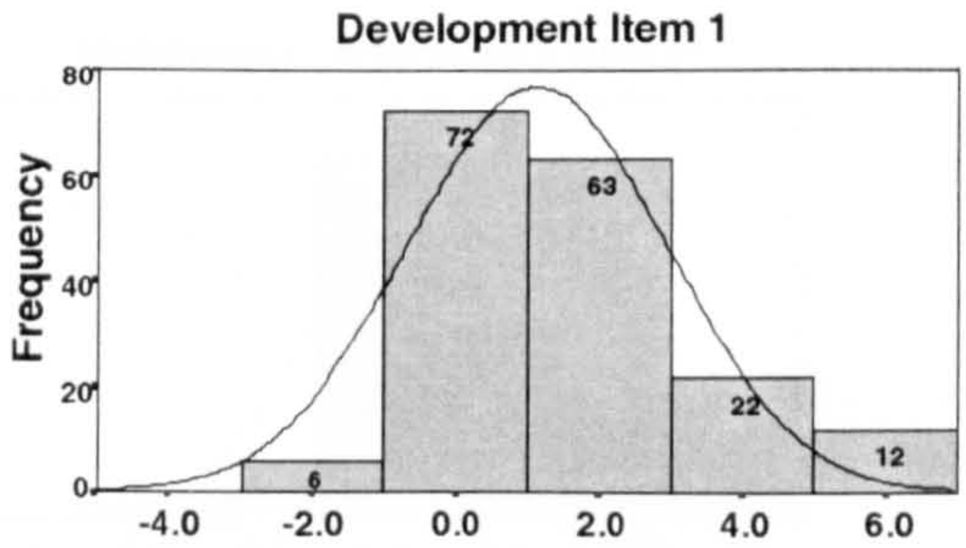


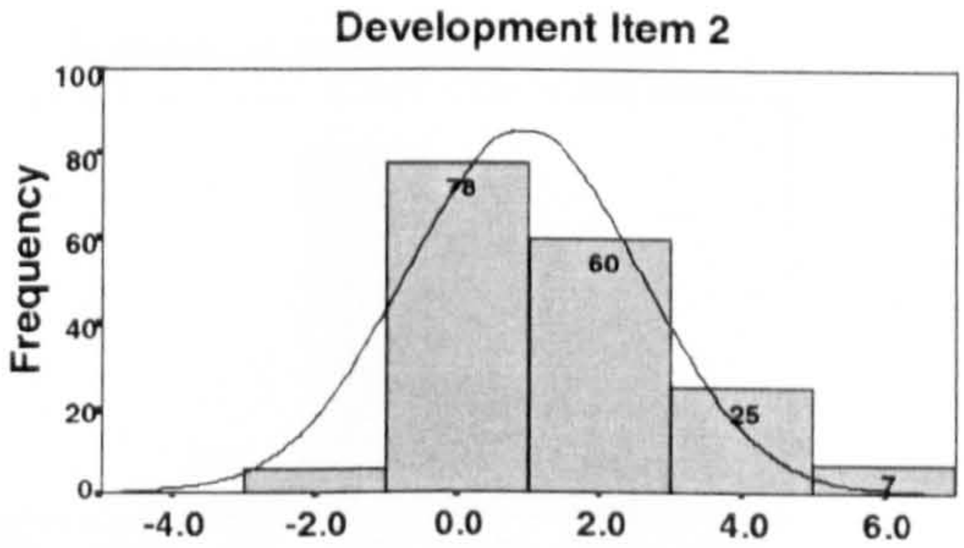


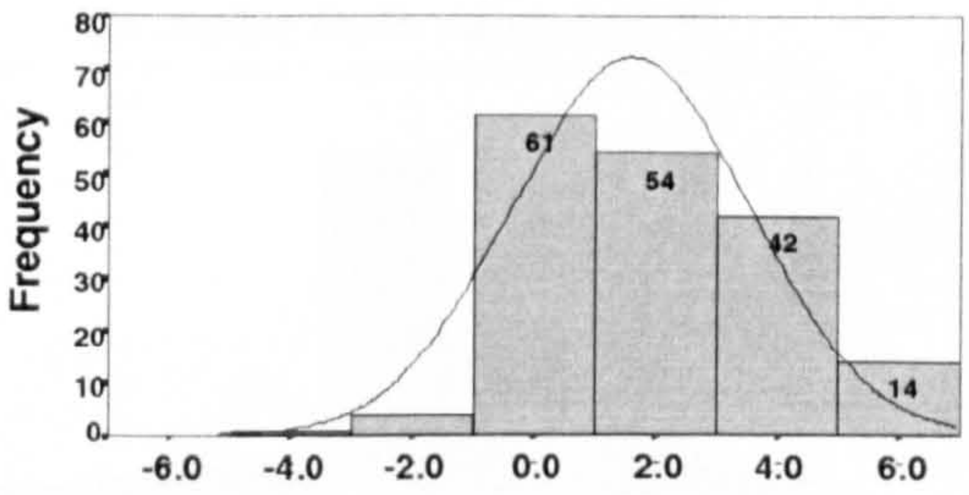


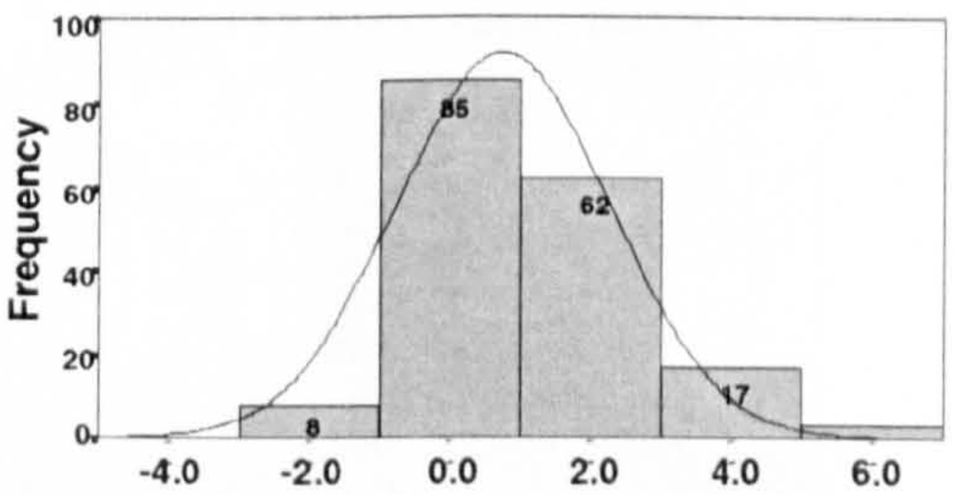


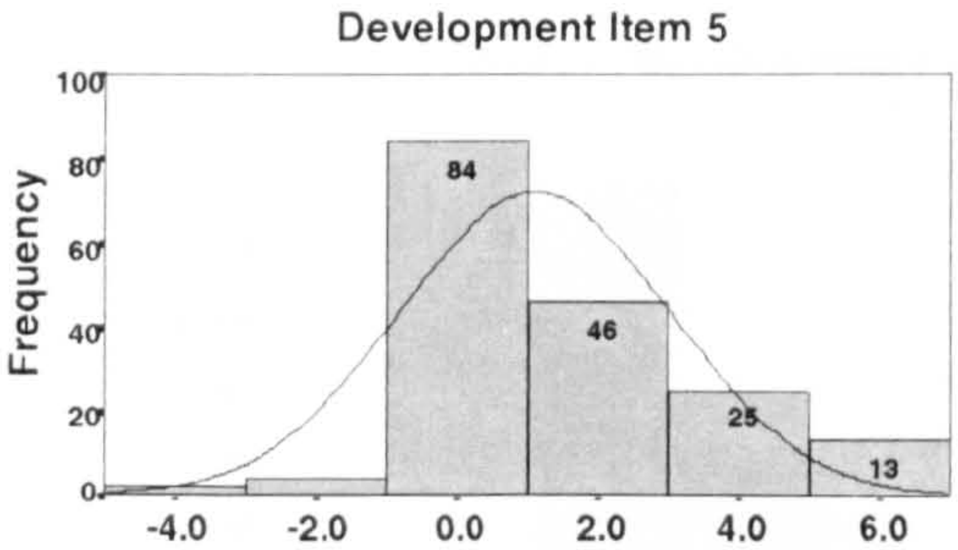
Histograms of Development Items



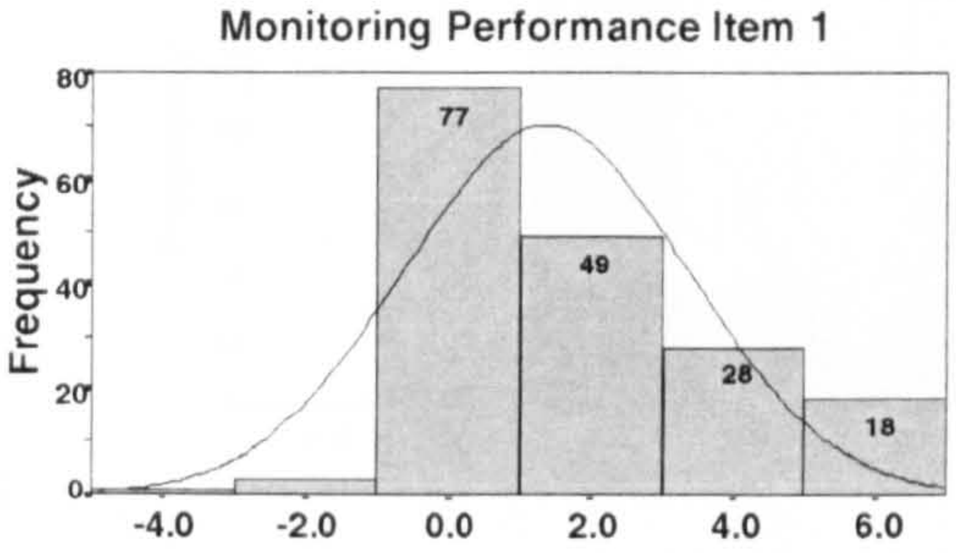


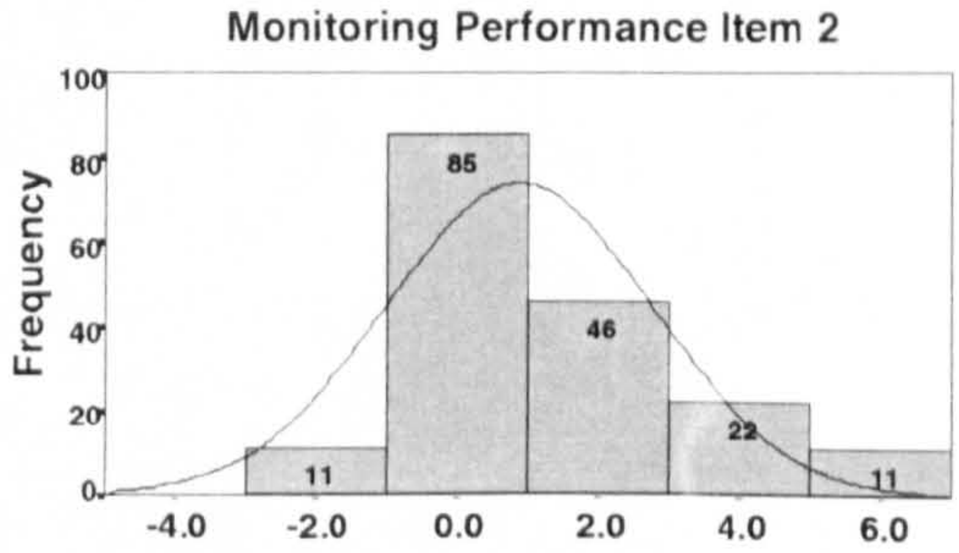


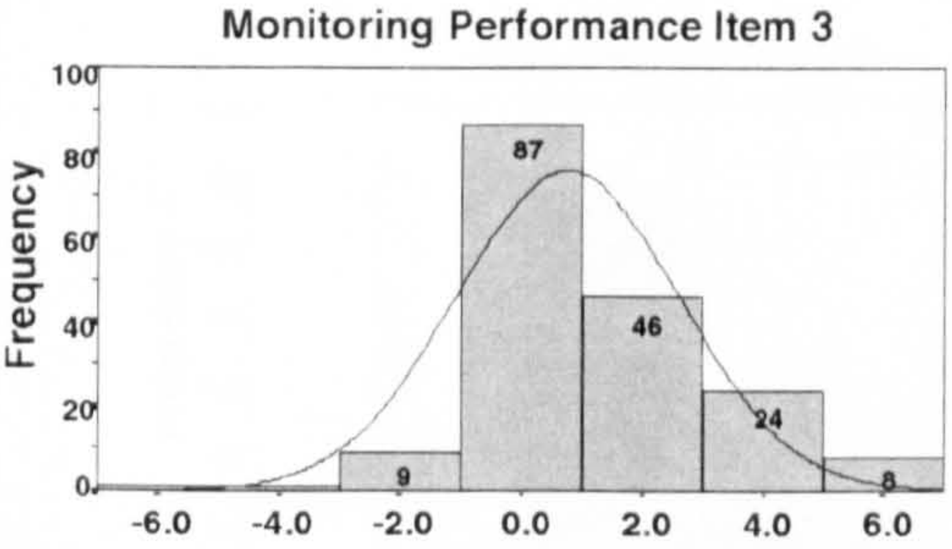


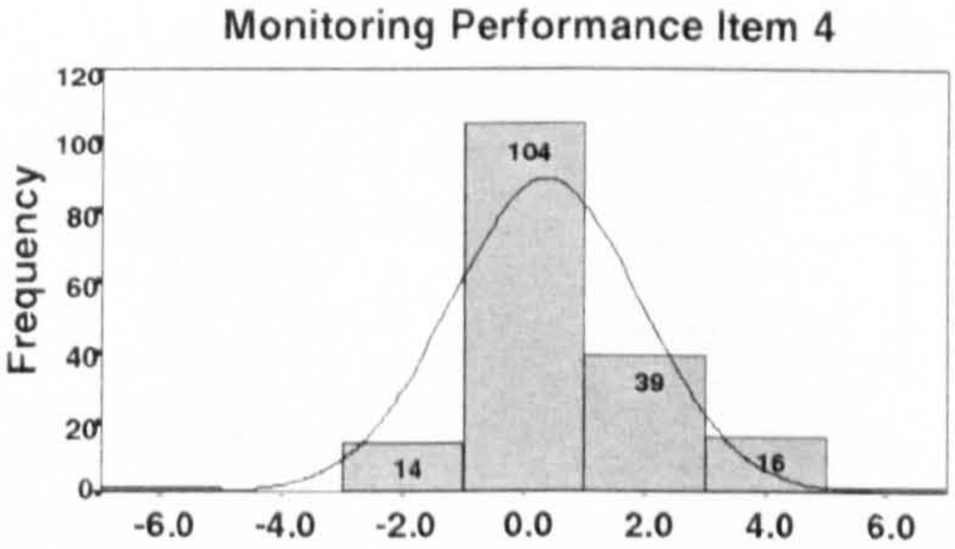


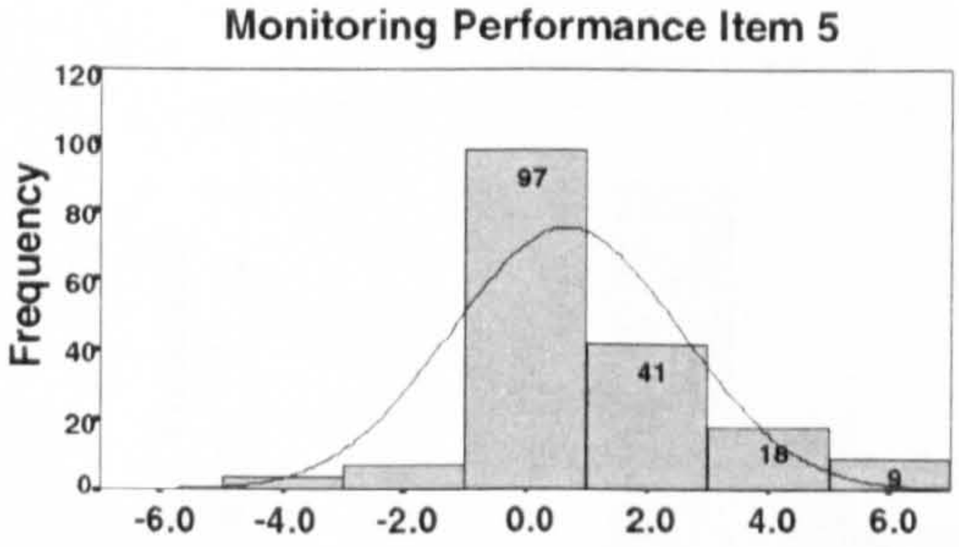
Histograms of Monitoring Performance Items

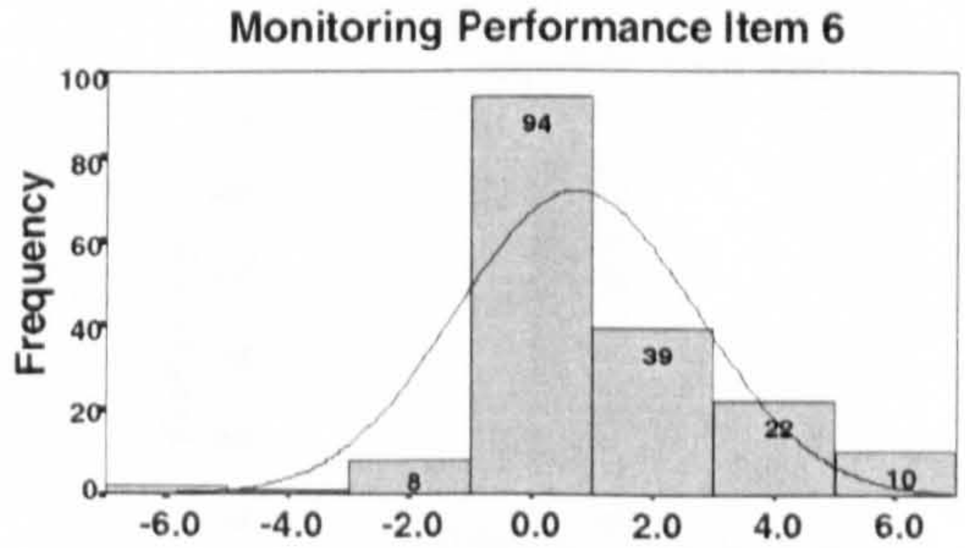




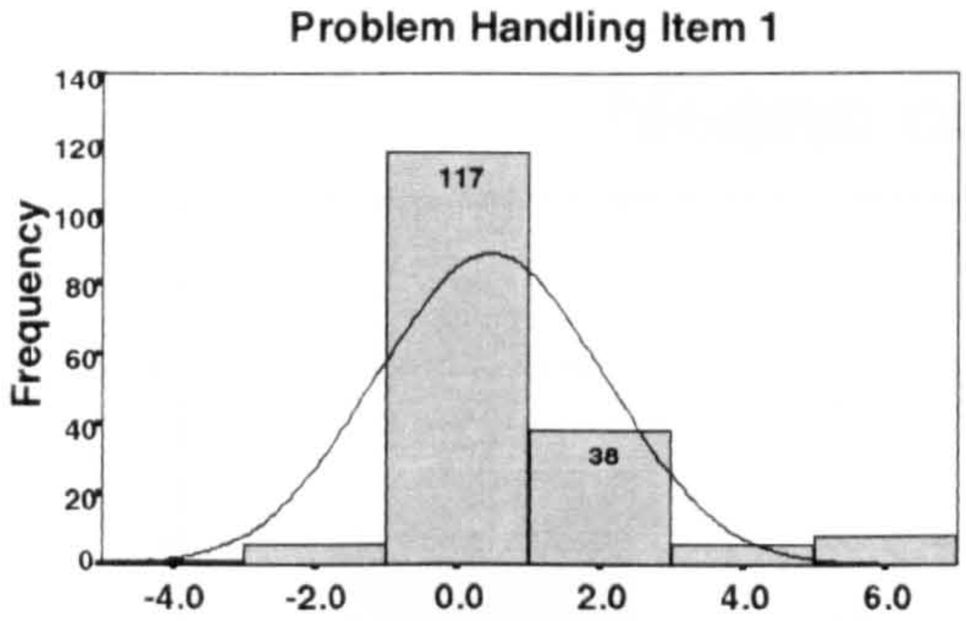


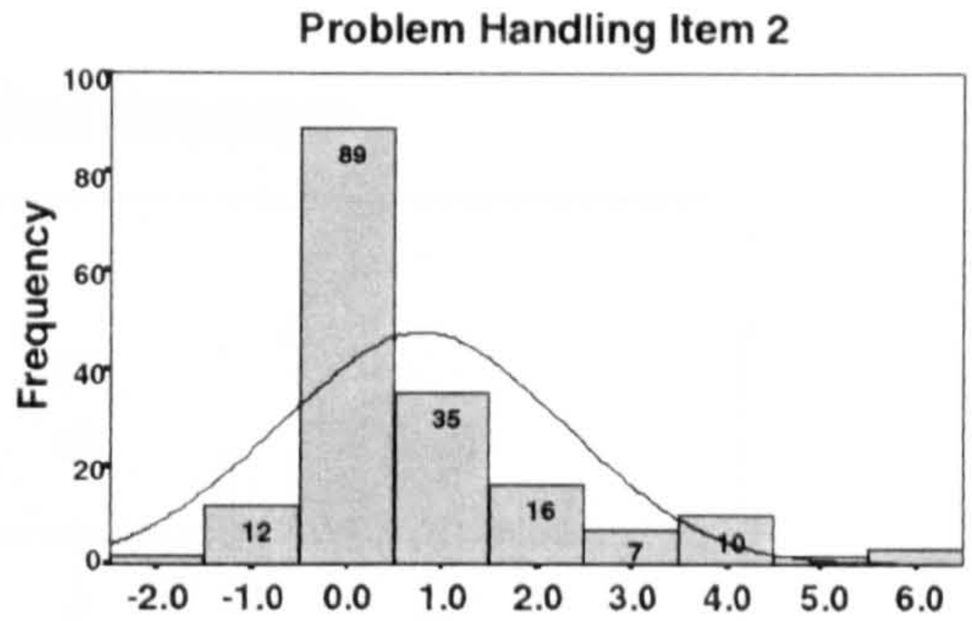


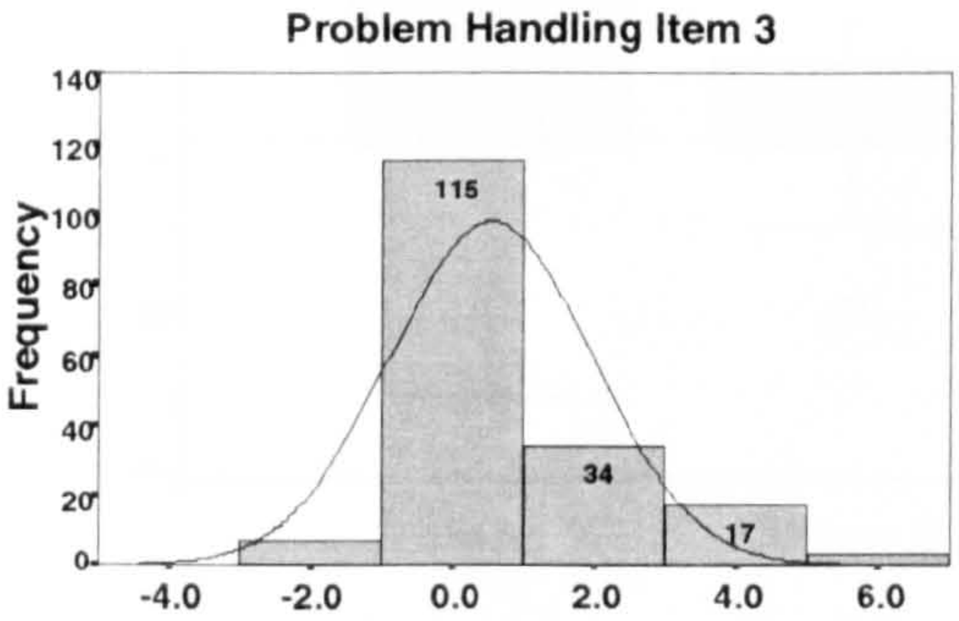




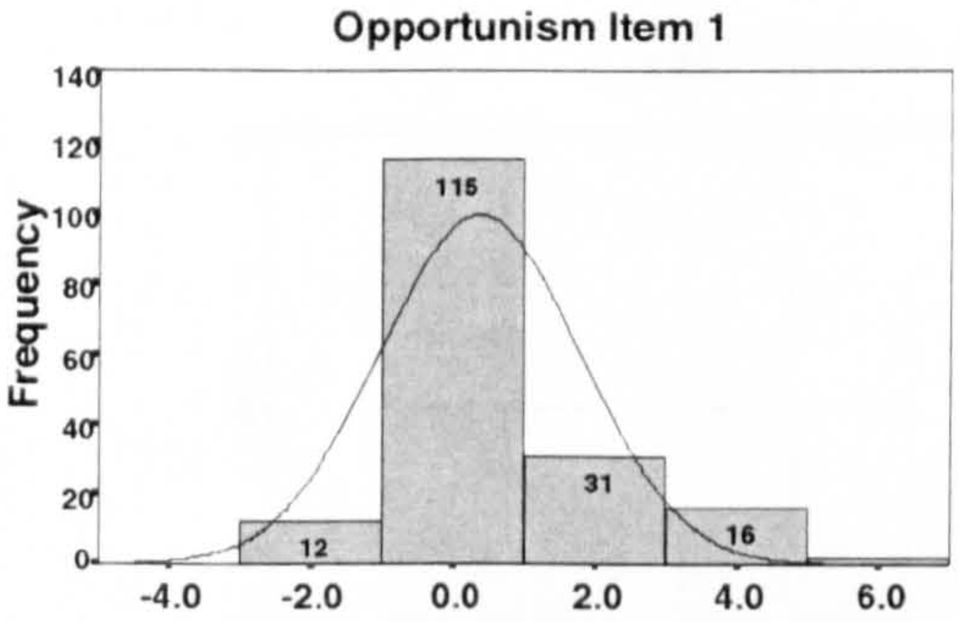
Histograms of Handling Problem Items

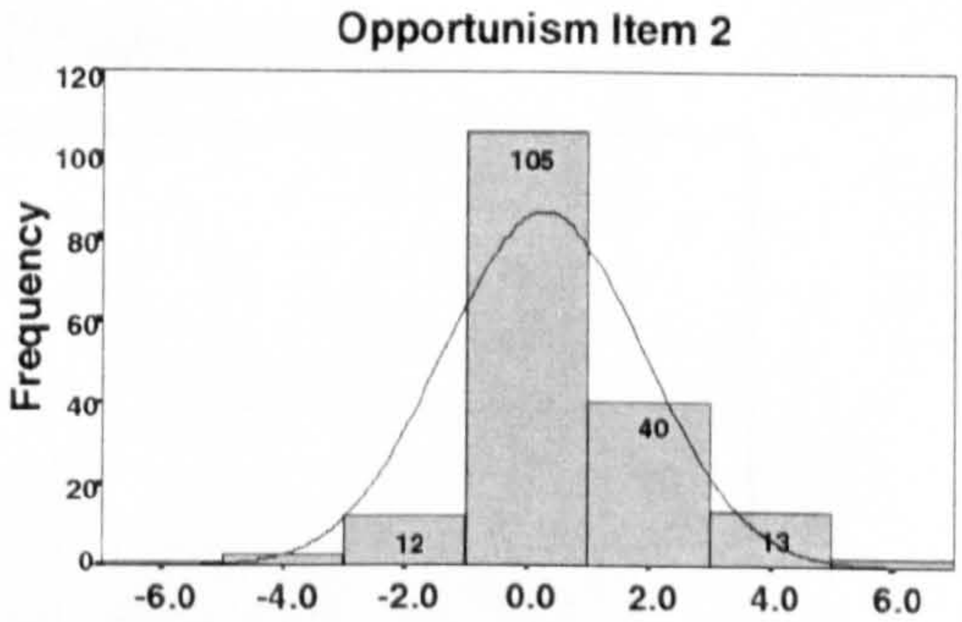


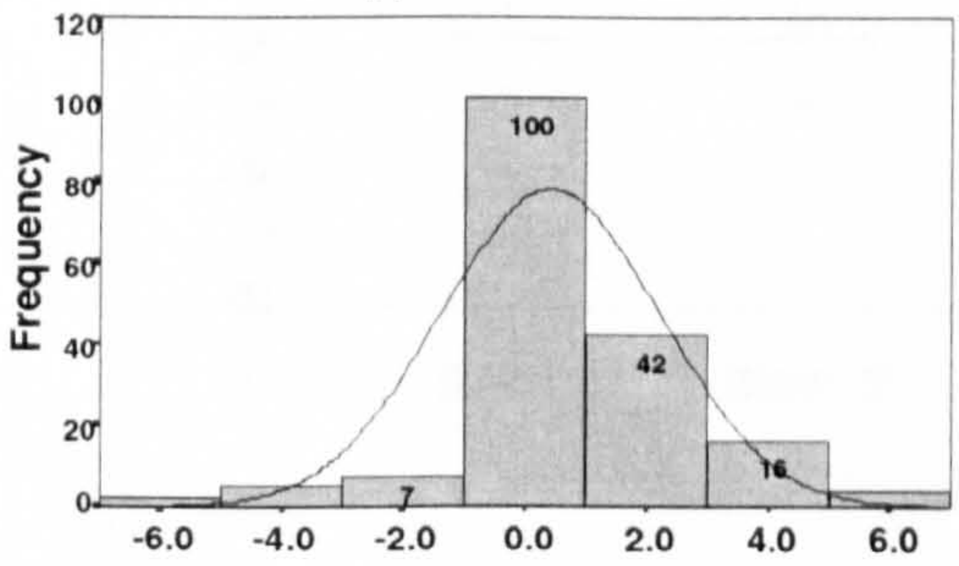


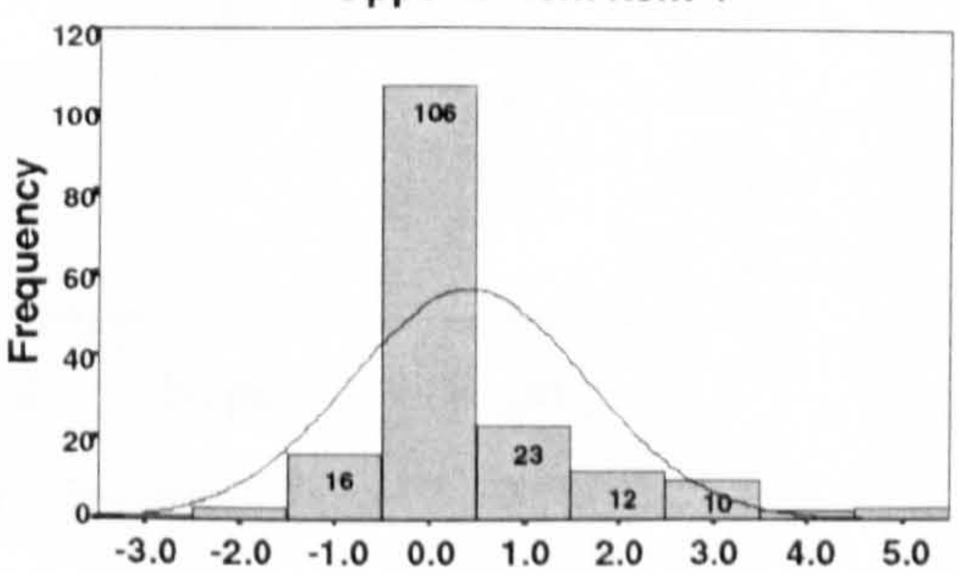


Histograms of Managing Opportunism Items

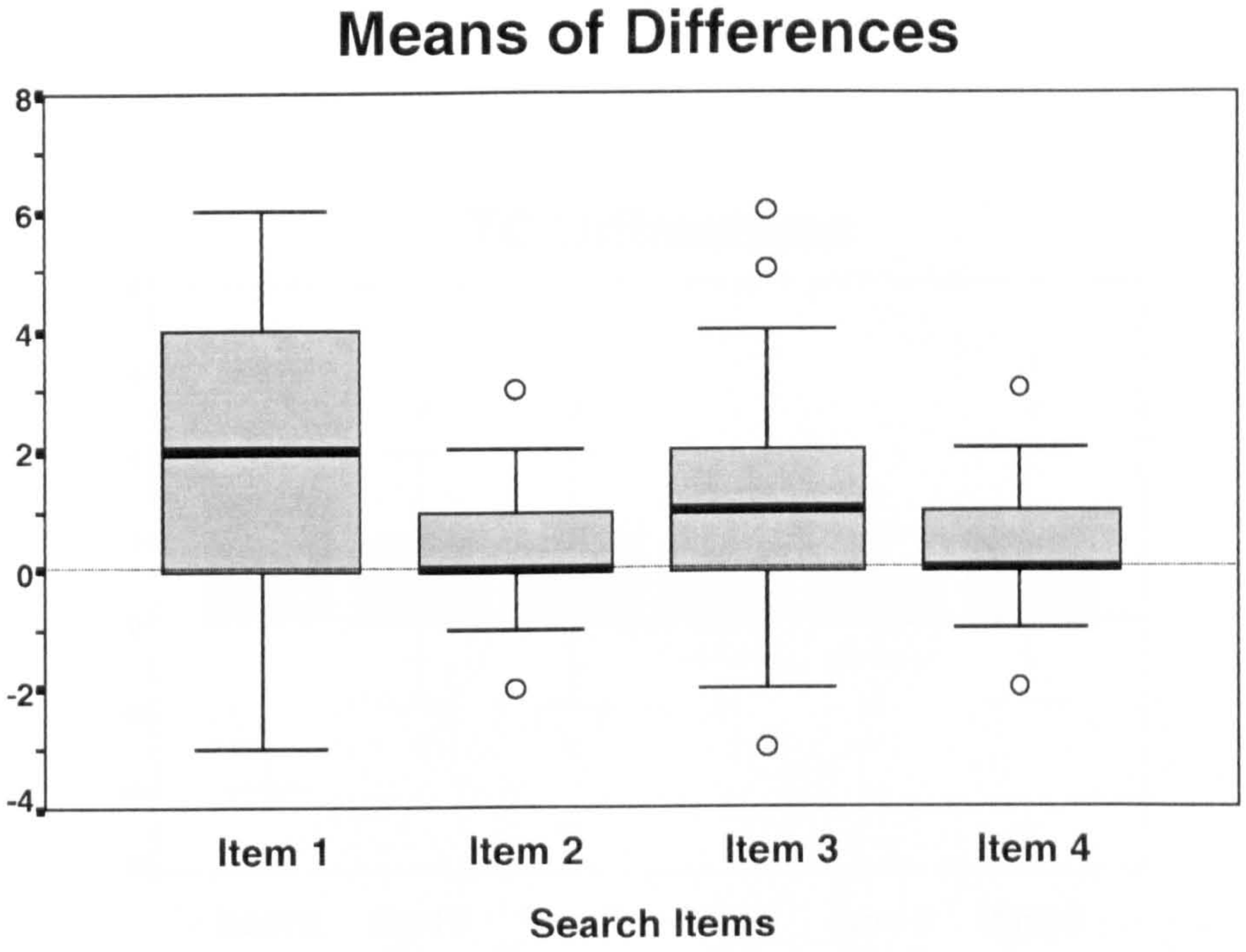








Appendix G (3)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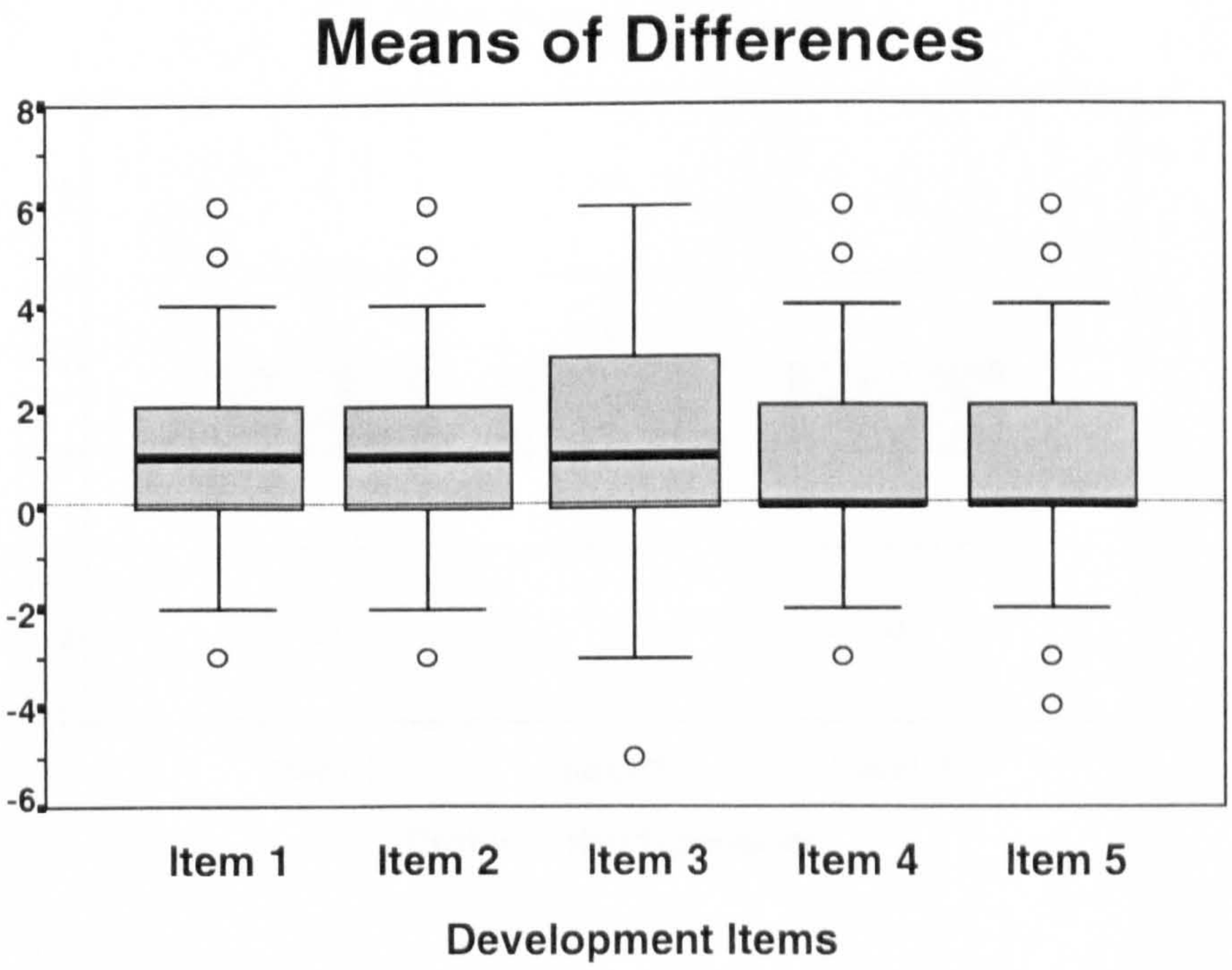
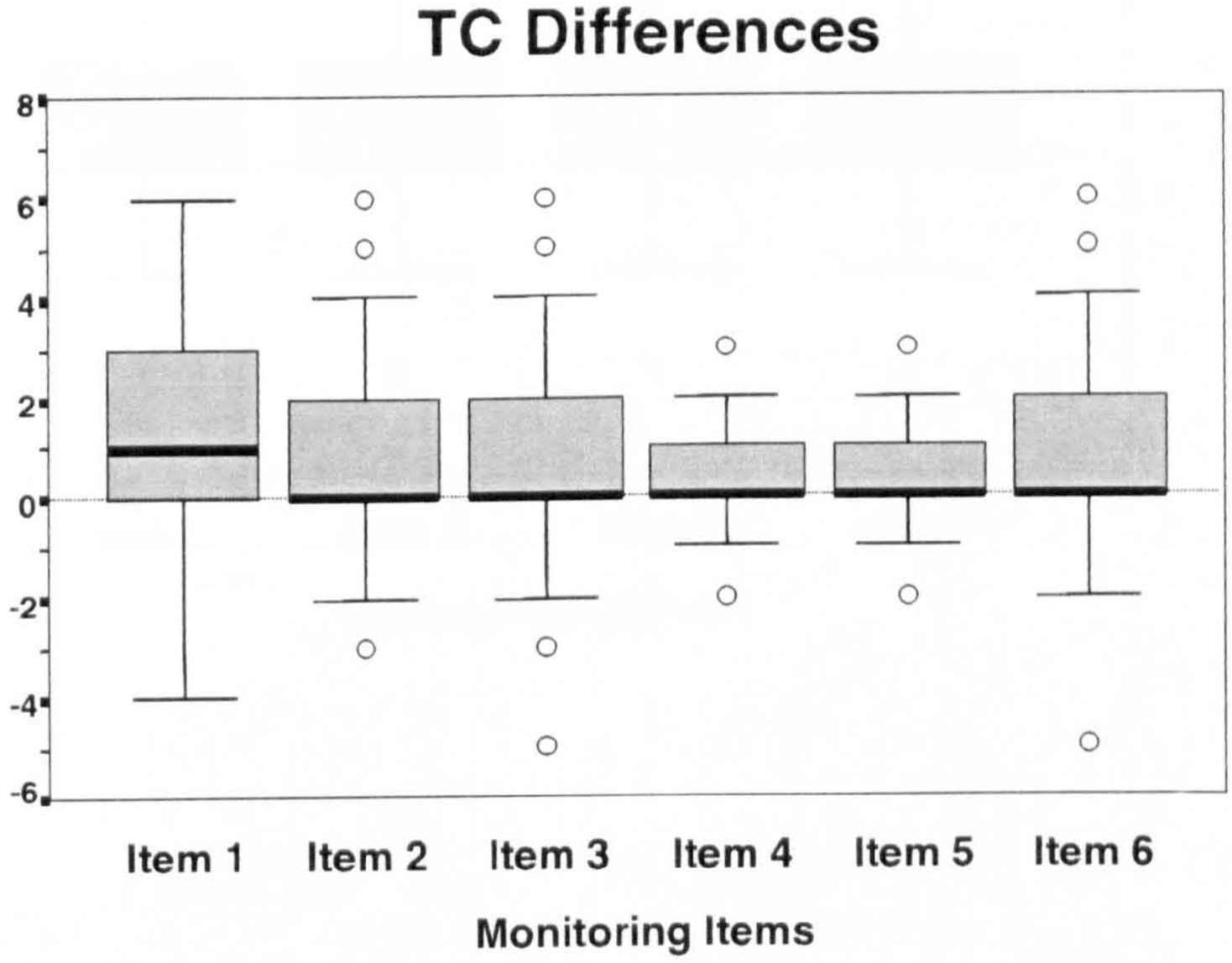
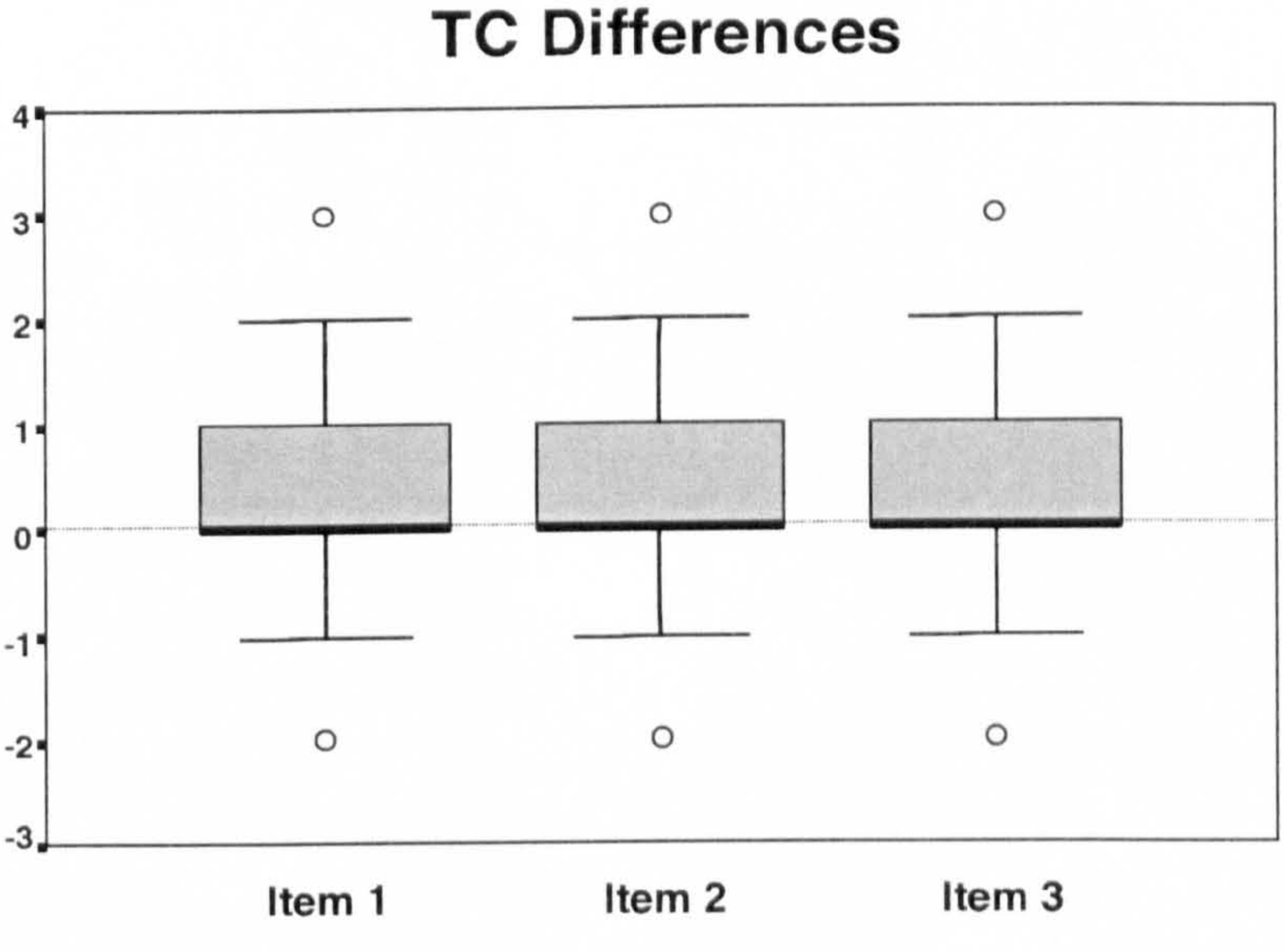
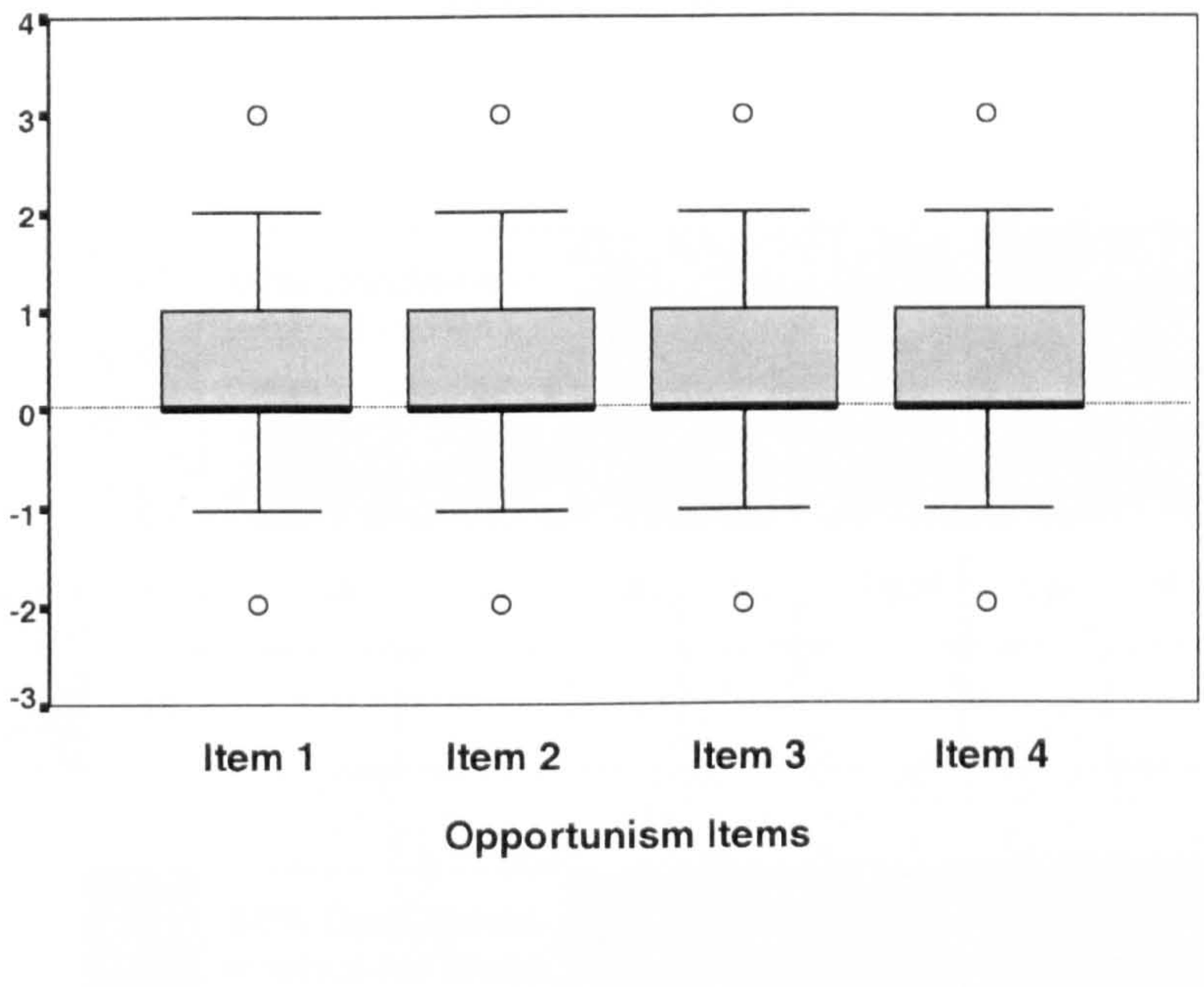
8
6
4
2
0
-2
-4
Item 1
Item 2
Item 3
Item 4
Search Items


Means of Differences
8
6
4
2
0
-2
-4
-6
Item 1
Item 2
Item 3
Item 4
Item 5
Development Items


TC Differences
8
6
4
2
0
-2
-4
-6
Item 1
Item 2
Item 3
Item 4
Item 5
Item 6
Monitoring Items


TC Differences
4
3
2
1
0
-1
-2
-3
Item 1
Item 2
Item 3
Problem Handling Items


TC Differences
4
3
2
1
0
-1
-2
-3
Item 1
Item 2
Item 3
Item 4
Opportunism Items

Appendix H (1)

Descriptives for Production Cost Advantages

Consolidation	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	.81	.52	1.10	.90	1.0	3.692	1.92	2.25	-.755	-.617
Standard Error	.15								.184	.366

Documentation	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	1.48	1.27	1.69	1.61	2.00	1.918	1.38	1.00	-1.239	1.674
Standard Error	.10								.184	.365

Information Handling	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	.40	.17	.64	.45	.00	2.473	1.57	2.00	-.300	-.484
Standard Error	.12								.184	.366

Payment & Collection	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	.74	.52	.95	.81	1.00	2.114	1.45	2.00	-.531	.273
Standard Error	.11								.184	.365

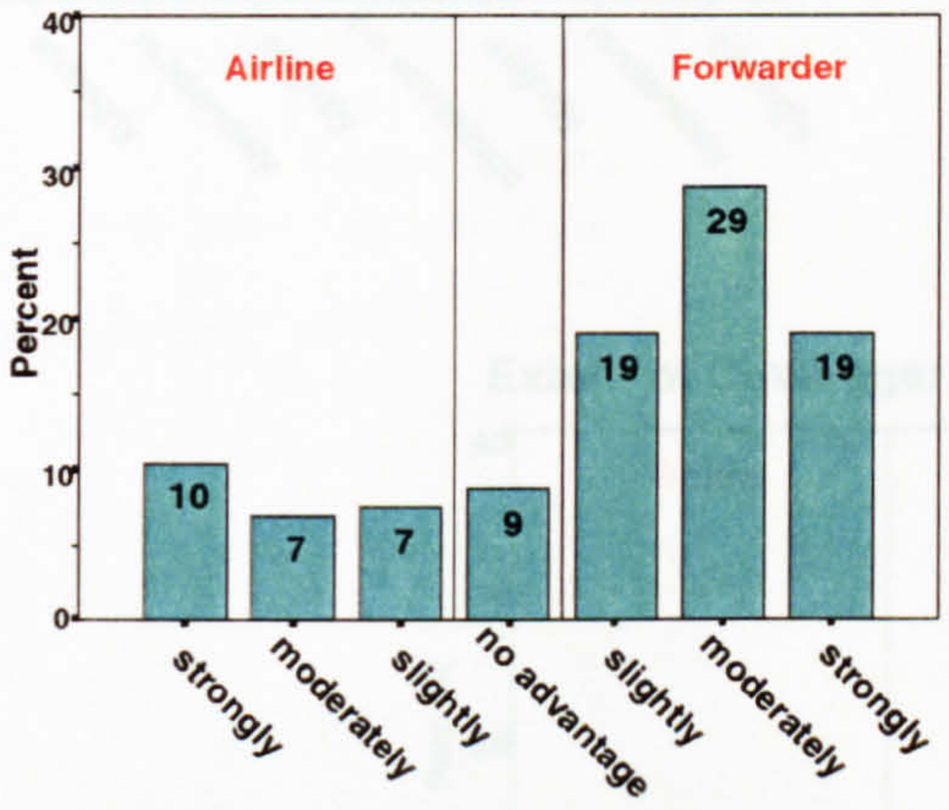
Value-Added Services	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	1.37	1.17	1.58	1.49	2.00	1.912	1.38	1.00	-.962	.766
Standard Error	.10								.184	.366

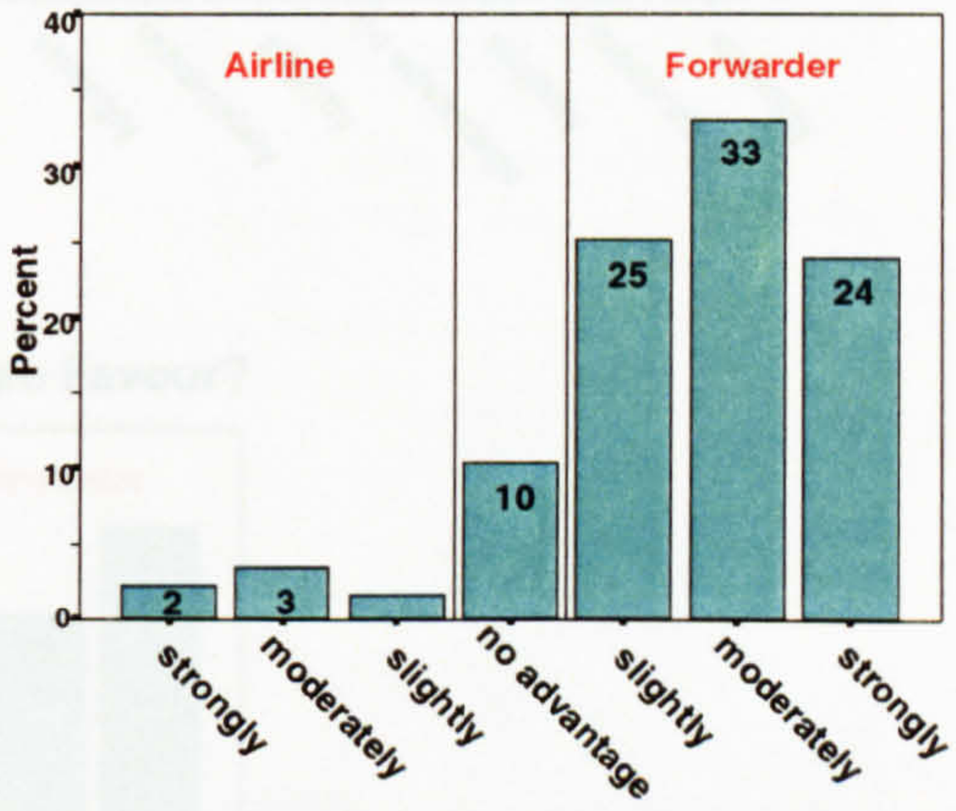
Door-to-Door	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	1.93	1.73	2.12	2.09	2.00	1.769	1.33	2.00	-1.711	3.134
Standard Error	.10								.184	.366

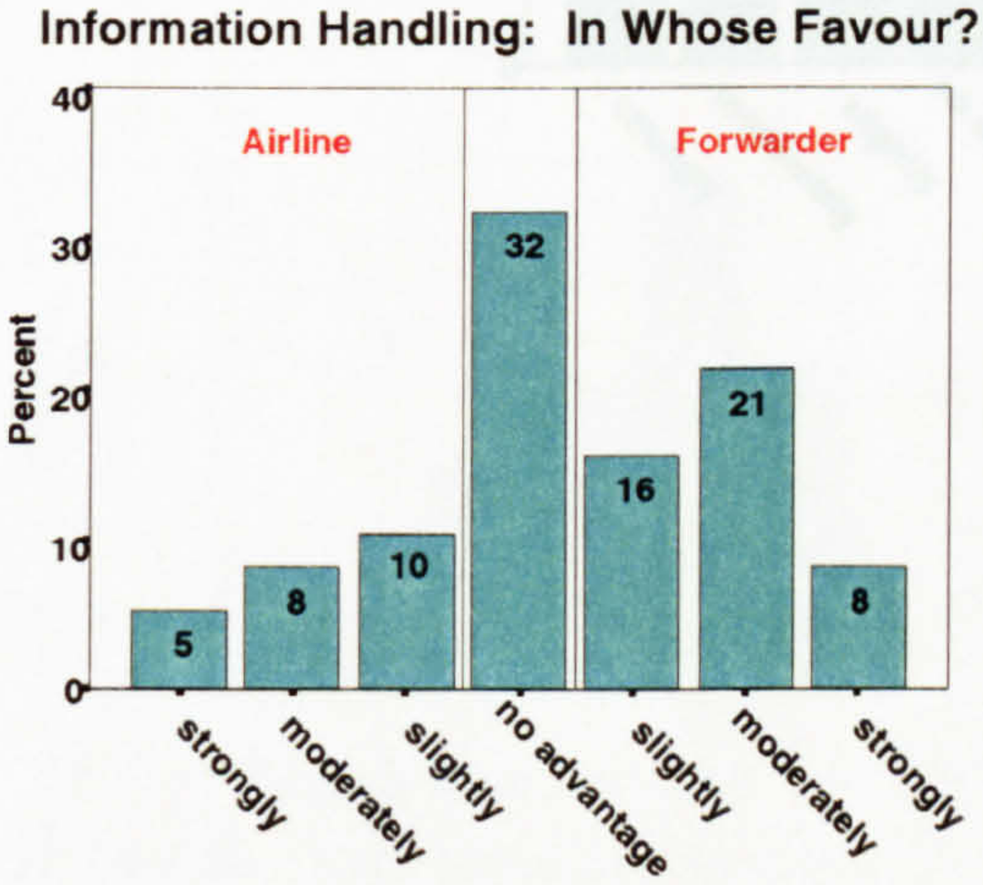
Extent of Coverage	Mean	95% Confidence Interval for Mean		Trimmed Mean (5%)	Median	Variance	Std. Deviation	Interquartile Range	Skewness	Kurtosis
		Lower Bound	Upper Bound							
Statistic	1.31	1.04	1.58	1.46	2.00	3.233	1.80	3.00	-.958	-.143
Standard Error	.14								.184	.366

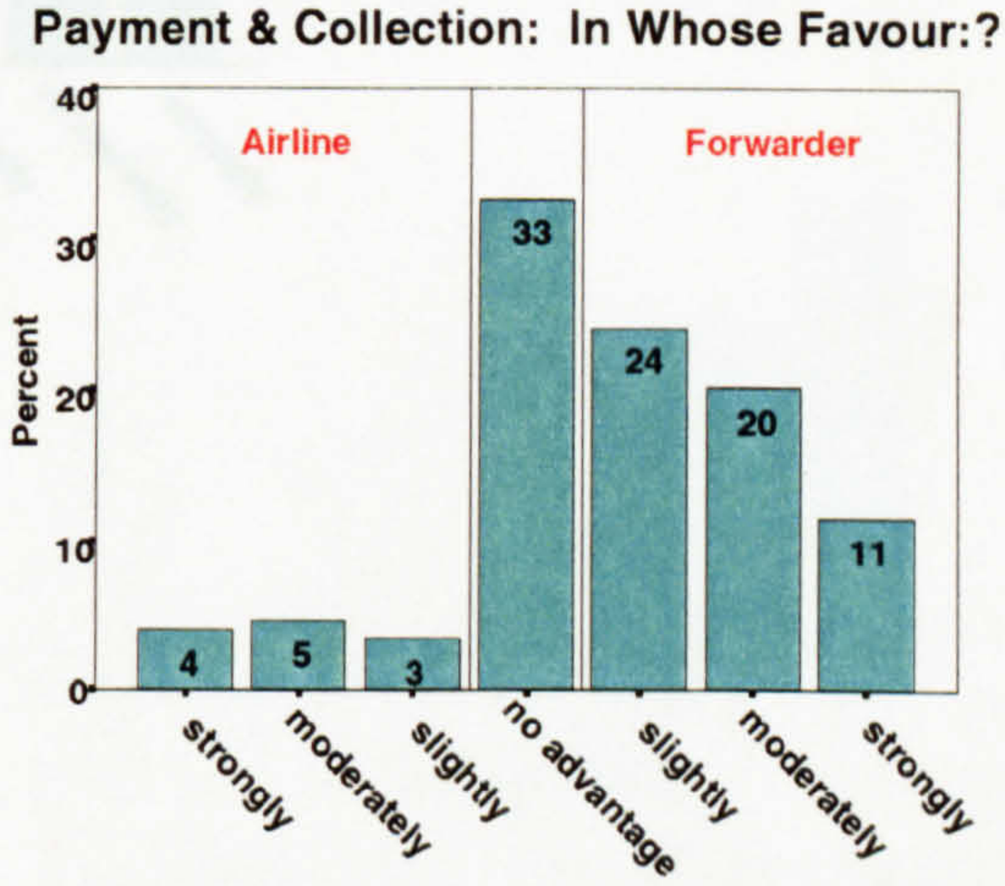
Appendix H (2)

Bar graphs of production cost advantages

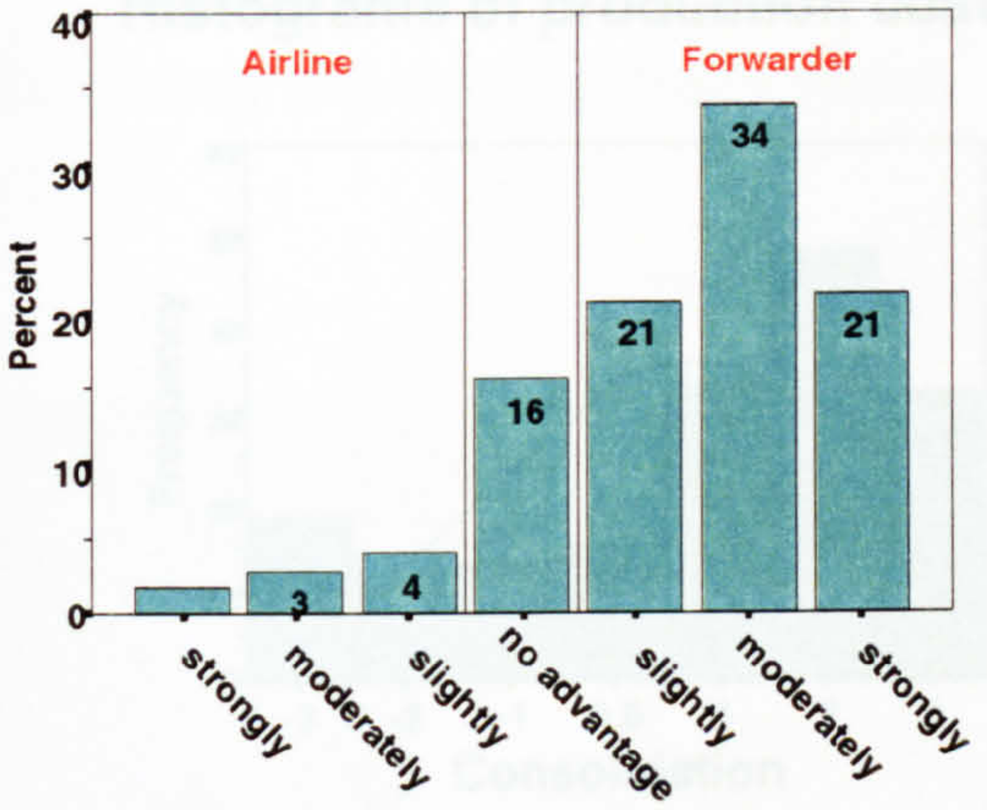




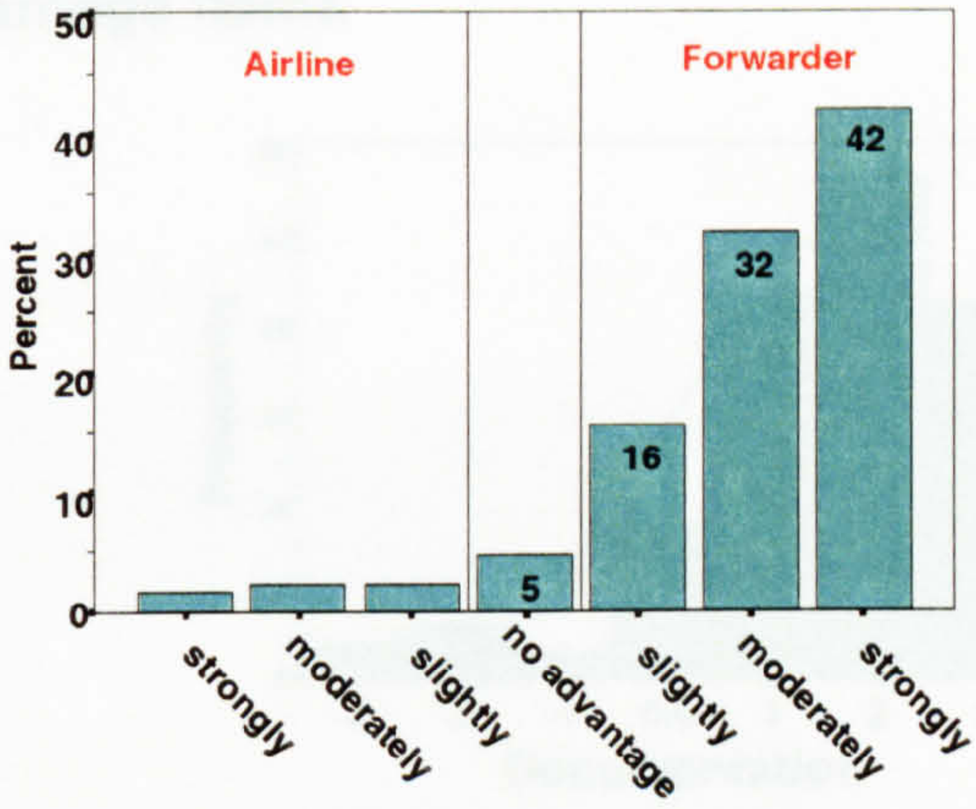




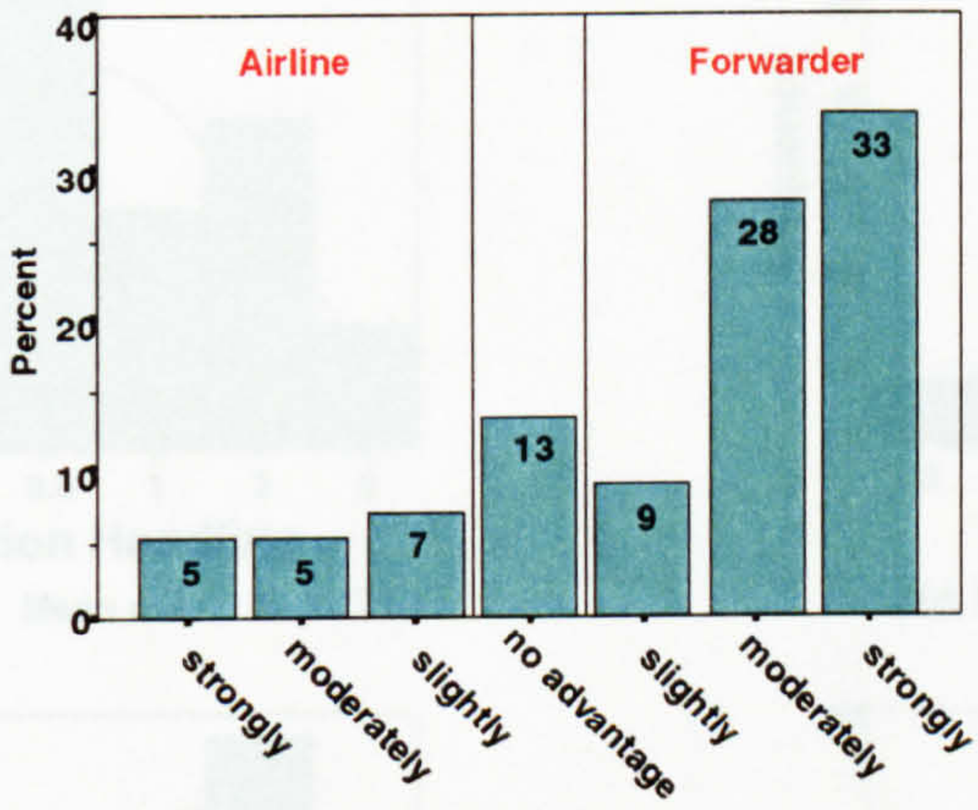
Value-Added Services: In Whose Favour?



Door-to-door: in whose favour

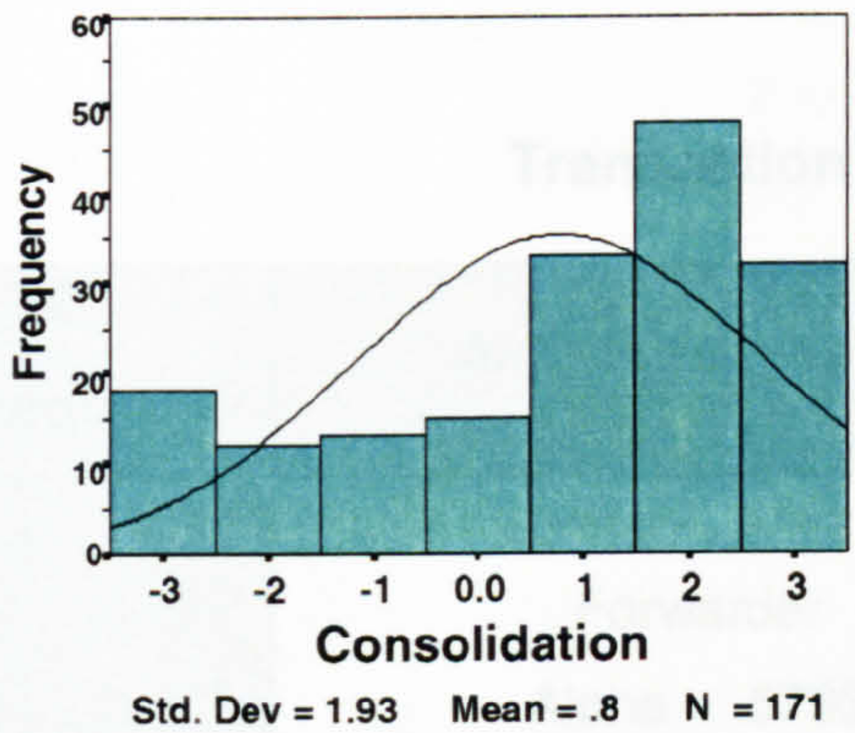


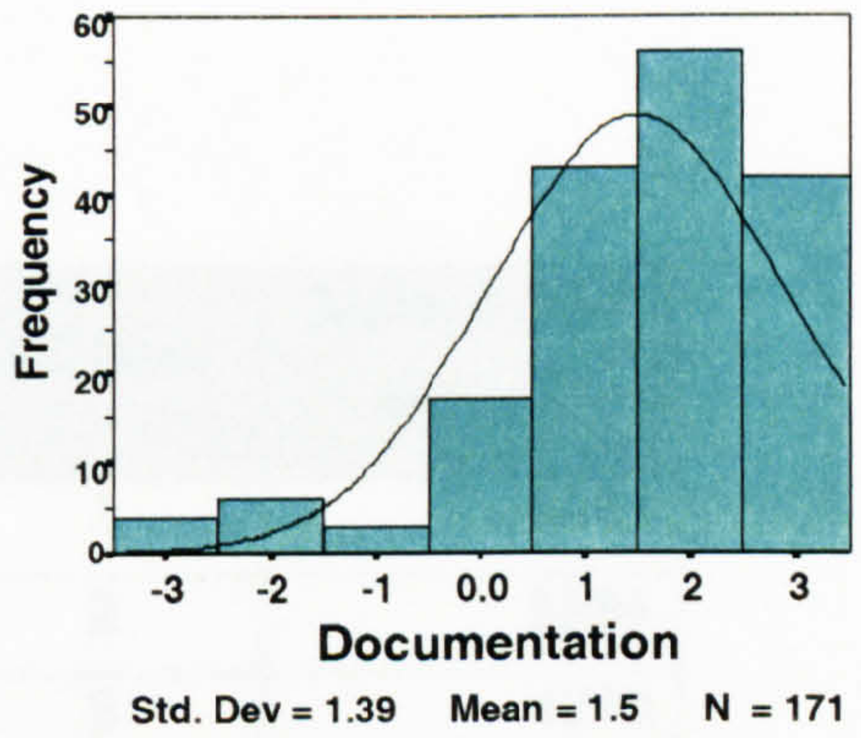
Extent of Coverage: In Whose Favour?

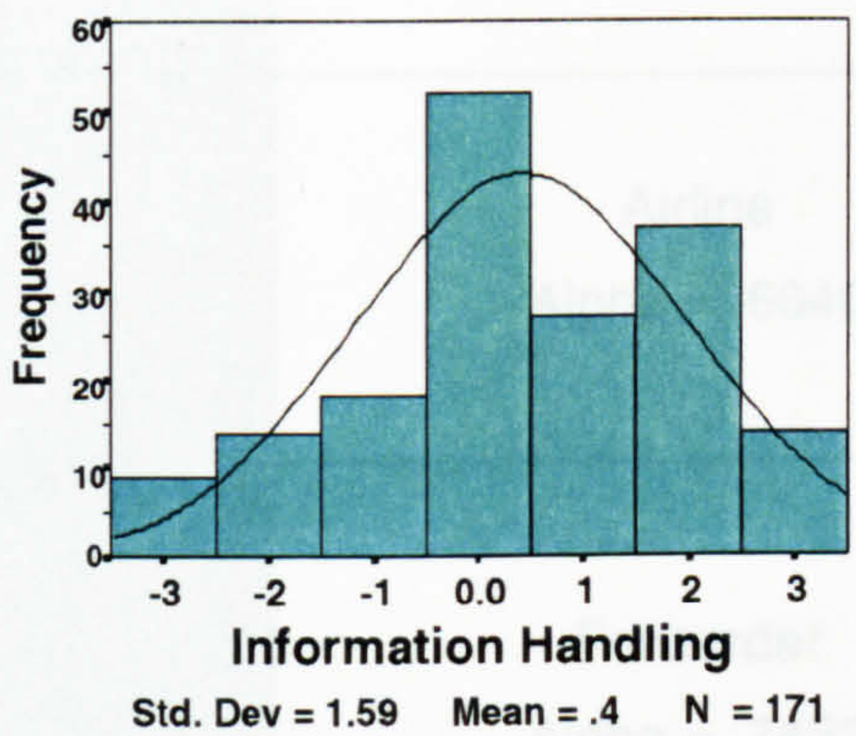


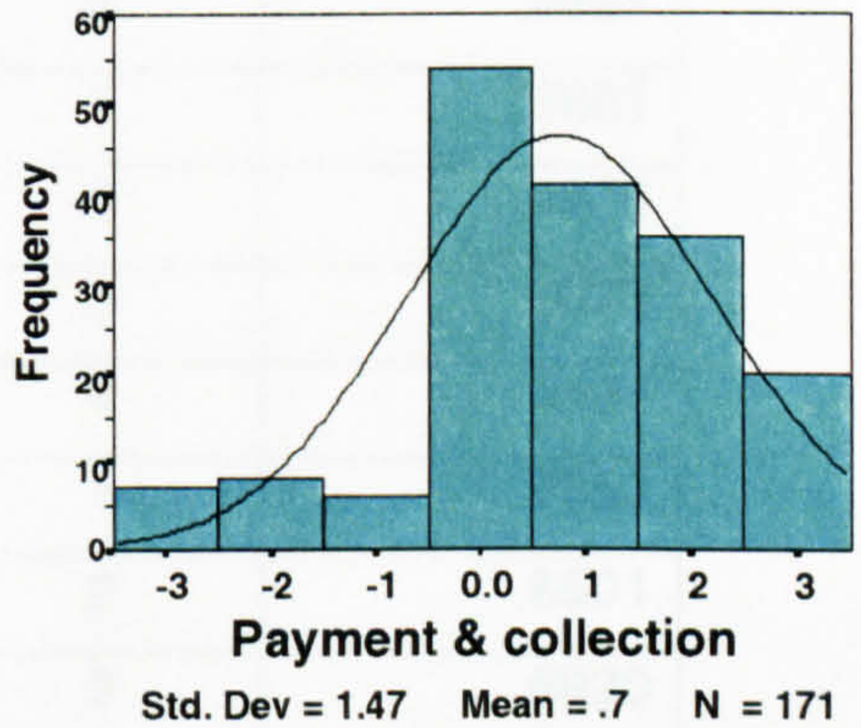
Appendix H (3)

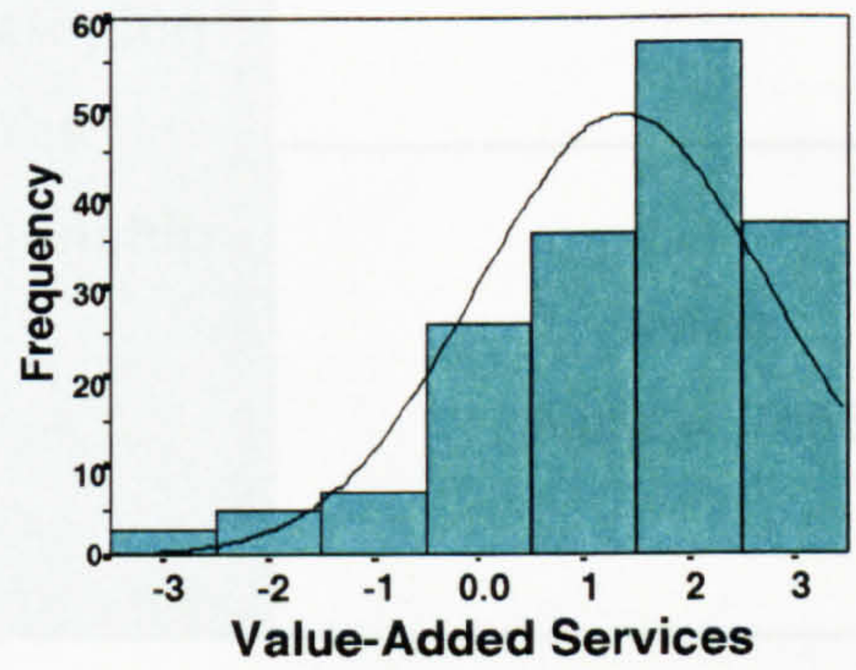
Histograms of production cost advantage items

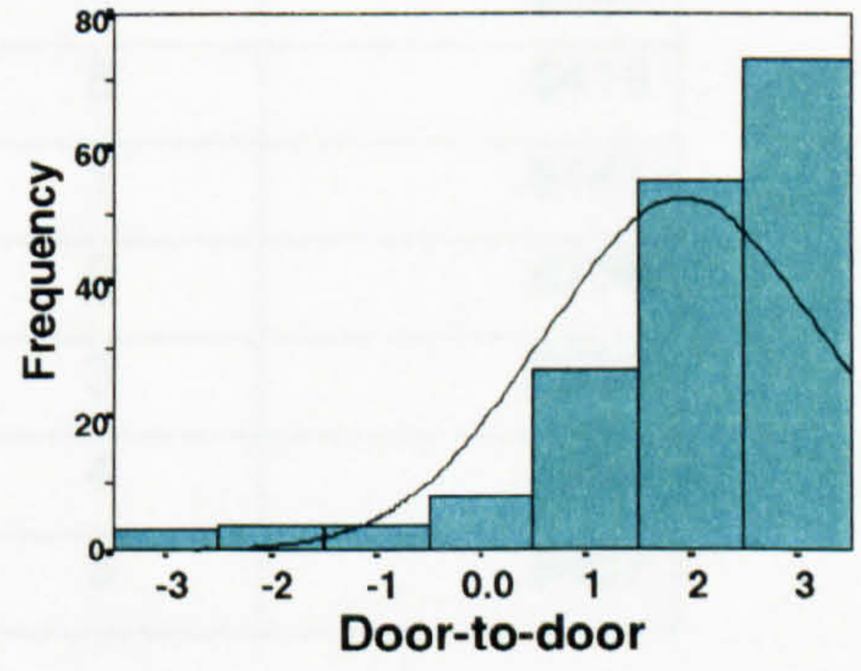


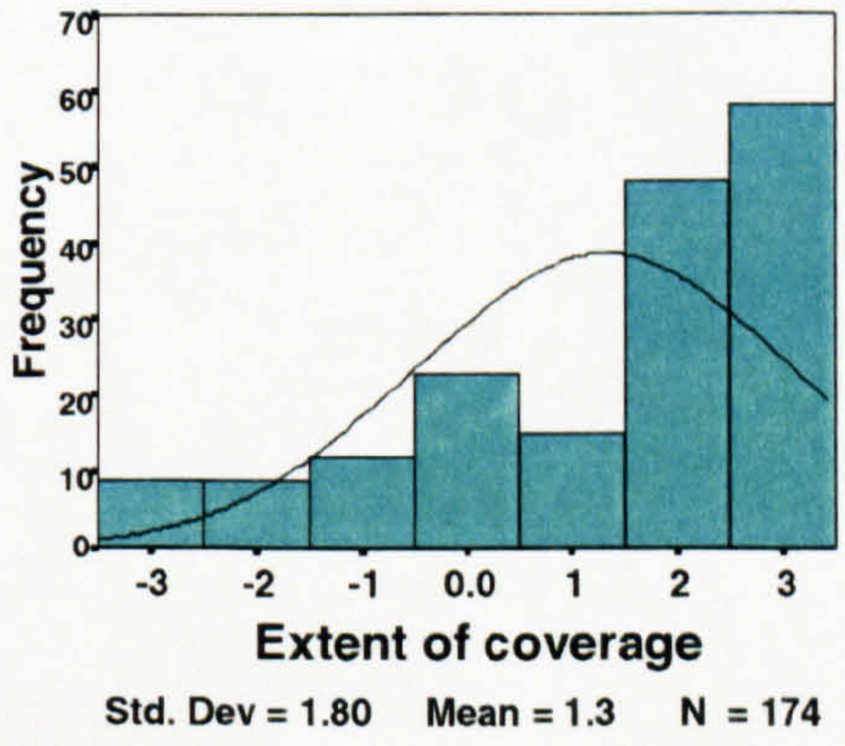












Appendix I (1)

Reliability tests – Cronbach Alpha

Transaction Cost Items

TC category	Airfreight Supplier	TC Item	Alpha if item deleted
Searching	Forwarder Alpha = .5793	1	.6082
		2	.5284
		3	.4272
		4	.4491
	Airline Alpha = .6040	1	.5861
		2	.4976
		3	.5078
		4	.5407
Developing the relationship	Forwarder Alpha = .7432	1	.7852
		2	.6501
		3	.6920
		4	.6884
		5	.6416
	Airline Alpha = .7566	1	.8141
		2	.6758
		3	.6556
		4	.7448
		5	.6457

Monitoring performance	Forwarder Alpha = .7376	1	.6841
		2	.6561
		3	.7023
		4	.7397
		5	.6749
		6	.7376
	Airline Alpha = .7882	1	.7504
		2	.7243
		3	.7277
		4	.8118
		5	.7192
		6	.7881
Handling problems	Forwarder Alpha = .4060	1	.7584
		2	-.2035
		3	-.0778
	Airline Alpha = .2208	1	.7082
		2	-.3249
		3	-.1804
Managing Opportunism	Forwarder Alpha = .6212	1	.5219
		2	.5036
		3	.6359
		4	.5411
	Airline Alpha = .6420	1	.5753
		2	.5711
		3	.5744
		4	.5737

Appendix I (2)

Reliability: Cronbach's Alpha Test – Production Cost Items

Production Cost Advantage (Alpha = .6197)	Alpha if item deleted
Consolidation	.5994
Documentation	.5539
Information handling	.5672
Payment & collection	.5659
Value-added services	.5846
Door-to-door services	.6095
Extent of coverage	.5972

Appendix J (1)

Factor Analysis (Principal Components Analysis) of Transaction Cost Items (Section 1)

Search Item Differences

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.773	44.313	44.313	1.773	44.313	44.313	1.477	36.929	36.929
2	1.168	29.193	73.505	1.168	29.193	73.505	1.463	36.577	73.505
3	.615	15.363	88.868						
4	.445	11.132	100.000						

Extraction Method: Principal Component Analysis.

Development Item Differences

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.970	59.408	59.408	2.970	59.408	59.408
2	.734	14.687	74.095			
3	.498	9.956	84.052			
4	.419	8.388	92.440			
5	.378	7.560	100.000			

Extraction Method: Principal Component Analysis.

Monitor Item Differences

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.871	47.851	47.851	2.871	47.851	47.851	2.826	47.107	47.107
2	1.001	16.681	64.532	1.001	16.681	64.532	1.046	17.425	64.532
3	.673	11.222	75.754						
4	.638	10.626	86.379						
5	.452	7.526	93.905						
6	.366	6.095	100.000						

Extraction Method: Principal Component Analysis.

Problem Item Differences (including Item 1)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.696	56.536	56.536	1.696	56.536	56.536
2	.913	30.440	86.976			
3	.391	13.024	100.000			

Extraction Method: Principal Component Analysis.

Problem Item Differences (excluding Item 1)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.579	78.973	78.973	1.579	78.973	78.973
2	.421	21.027	100.000			

Extraction Method: Principal Component Analysis.

Opportunism Item Differences

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.764	44.103	44.103	1.764	44.103	44.103
2	.886	22.158	66.261			
3	.825	20.619	86.880			
4	.525	13.120	100.000			

Extraction Method: Principal Component Analysis.

Appendix J (2)

Factor Analysis (Principal Components Analysis) of Transaction Cost Items (Section 1) – Component matrices

Rotated Component Matrix		Component	
		1	2
Search Items (forwarder minus airline scores)	1	.862	-1.502E-02
	2	-1.456E-02	.858
	3	.834	.198
	4	.196	.829

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

Component Matrix		Component
		1
Development Items (forwarder minus airline scores)	1	.753
	2	.796
	3	.815
	4	.660
	5	.818

Extraction Method: Principal Component Analysis.
One component extracted.

Rotated Component Matrix		Component	
		1	2
Monitor Items (forwarder minus airline scores)	1	.781	.179
	2	.783	5.863E-02
	3	.728	.223
	4	4.654E-02	.974
	5	.779	-5.325E-02
	6	.681	-9.795E-02

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

Component Matrix		Component
		1
Problem Items (including Item 1) (forwarder minus airline scores)	1	.497
	2	.886
	3	.815
Extraction Method: Principal Component Analysis. One component extracted.		

Component Matrix		Component
		1
Problem Items (less Item 1) (forwarder minus airline scores)	2	.889
	3	.889
Extraction Method: Principal Component Analysis. One component extracted.		

Component Matrix		Component
		1
Opportunism Items (forwarder minus airline scores)	1	.707
	2	.561
	3	.542
	4	.810
Extraction Method: Principal Component Analysis. One component extracted.		

Appendix J (3)

Principal Axis Factoring (with VARIMAX Rotation)

Rotated Factor Matrix (for all 22 Items)

TC Item		Factor					
		1	2	3	4	5	6
Search	Item 1	.537		.153			
	Item 2			.116		.682	
	Item 3	.693	.125			.143	-.130
	Item 4	.221	.314		.144	.618	
Develop	Item 1	.685	.121	.164	.107		.142
	Item 2	.566	.291		.102		.339
	Item 3	.660	.188	.170	.161		.216
	Item 4	.360	.244		.273	.128	.297
	Item 5	.518	.224		.326	.150	.490
Monitor	Item 1	.374	.634	.221	.104	.138	
	Item 2		.692	.158			.257
	Item 3	.145	.638	.262		.110	-.103
	Item 4			.369			
	Item 5		.698		.196	.104	.213
	Item 6	.165	.473		.237	.129	
Problem	Item 1	.156	.240	.324			.226
	Item 2	.273	.494	.244	.520		
	Item 3	.172	.225		.794		
Opportunism	Item 1			.473			
	Item 2			.463		-.179	.201
	Item 3	.234		.338		.143	
	Item 4	.193	.117	.652	.102		

Factor	TC Item	
1	Development	Items 1 through 5
	Search	Items 1 & 3
2	Monitor	Items 1, 2, 3, 5, & 6
3	Opportunism	Items 1 through 4
	Monitor	Item 4
	Problem	Item 1
4	Problem	Items 2 & 3
5	Search	Items 2 & 4

Appendix J (4)

Factor Analysis (Principal Components Analysis) of Production Cost Advantage Items (Section 1)

Table of Variance Explanation

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.166	30.943	30.943	2.166	30.943	30.943	2.023	28.901	28.901
2	1.332	19.031	49.974	1.332	19.031	49.974	1.475	21.073	49.974
3	.930	13.281	63.255						
4	.880	12.565	75.820						
5	.625	8.931	84.752						
6	.570	8.147	92.898						
7	.497	7.102	100.000						

Extraction Method: Principal Component Analysis.

Rotated Component Matrix	Component	
	1	2
Consolidation	.432	.240
Documentation	.666	.158
Information handling	.696	-3.546E-02
Payment & collection	.741	-.108
Value-added services	.590	.161
Door-to-door	4.026E-02	.854
Extent of coverage	.102	.790

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

Rotated Component Matrix	Component		
	1	2	3
Consolidation		.186	.804
Documentation	.653	.147	.200
Information handling	.527		.487
Payment & collection	.631	-.133	.383
Value-added services	.811	.181	-.253
Door-to-door	.114	.862	
Extent of coverage		.775	.235

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
Rotation converged in 3 iterations.

Appendix K (1)

Cross Tabulations – Chi-Squared Tests

Item		Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Search Items	Item 1	Pearson Chi-Square	72.490	36	.000
		Likelihood Ratio	78.367	36	.000
		Linear-by-Linear Association	25.960	1	.000
	Item 2	Pearson Chi-Square	235.221	36	.000
		Likelihood Ratio	177.494	36	.000
		Linear-by-Linear Association	63.962	1	.000
	Item 3	Pearson Chi-Square	146.807	36	.000
		Likelihood Ratio	123.129	36	.000
		Linear-by-Linear Association	42.038	1	.000
	Item 4	Pearson Chi-Square	186.378	36	.000
		Likelihood Ratio	152.021	36	.000
		Linear-by-Linear Association	47.292	1	.000
Cells with expected count less than 5 range between 71.4% and 77.6%. Minimum expected count ranges between .07 and .72.					
Development Items	Item 1	Pearson Chi-Square	83.322	30	.000
		Likelihood Ratio	90.045	30	.000
		Linear-by-Linear Association	20.046	1	.000
	Item 2	Pearson Chi-Square	146.753	36	.000
		Likelihood Ratio	109.704	36	.000
		Linear-by-Linear Association	46.771	1	.000
	Item 3	Pearson Chi-Square	82.768	36	.000
		Likelihood Ratio	77.670	36	.000
		Linear-by-Linear Association	9.014	1	.003
	Item 4	Pearson Chi-Square	124.009	36	.000
		Likelihood Ratio	91.686	36	.000
		Linear-by-Linear Association	42.585	1	.000
	Item 5	Pearson Chi-Square	146.354	36	.000
		Likelihood Ratio	118.495	36	.000
		Linear-by-Linear Association	16.738	1	.000
Cells with expected count less than 5 range between 64.3% and 79.6%. Minimum expected count ranges between .15 and ..37.					

Item		Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Monitor Items	Item 1	Pearson Chi-Square	139.307	36	.000
		Likelihood Ratio	130.286	36	.000
		Linear-by-Linear Association	28.788	1	.000
	Item 2	Pearson Chi-Square	155.295	36	.000
		Likelihood Ratio	132.631	36	.000
		Linear-by-Linear Association	44.826	1	.000
	Item 3	Pearson Chi-Square	146.640	36	.000
		Likelihood Ratio	118.193	36	.000
		Linear-by-Linear Association	26.855	1	.000
	Item 4	Pearson Chi-Square	236.681	36	.000
		Likelihood Ratio	180.145	36	.000
		Linear-by-Linear Association	63.284	1	.000
	Item 5	Pearson Chi-Square	222.439	36	.000
		Likelihood Ratio	143.635	36	.000
		Linear-by-Linear Association	25.500	1	.000
	Item 6	Pearson Chi-Square	161.616	36	.000
		Likelihood Ratio	143.723	36	.000
		Linear-by-Linear Association	31.002	1	.000
Cells with expected count less than 5 range between 65.3% and 77.6%. Minimum expected count ranges between .18 and .95.					
Problem Items	Item 1	Pearson Chi-Square	274.114	36	.000
		Likelihood Ratio	193.052	36	.000
		Linear-by-Linear Association	35.261	1	.000
	Item 2	Pearson Chi-Square	257.463	36	.000
		Likelihood Ratio	192.295	36	.000
		Linear-by-Linear Association	46.970	1	.000
	Item 3	Pearson Chi-Square	325.221	36	.000
		Likelihood Ratio	223.615	36	.000
		Linear-by-Linear Association	62.458	1	.000
Cells with expected count less than 5 range between 63.3% and 69.4%. Minimum expected count ranges between .08 and .14.					

Item		Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Opportunism Items	Item 1	Pearson Chi-Square	287.239	36	.000
		Likelihood Ratio	228.266	36	.000
		Linear-by-Linear Association	83.686	1	.000
	Item 2	Pearson Chi-Square	233.121	36	.000
		Likelihood Ratio	172.354	36	.000
		Linear-by-Linear Association	53.466	1	.000
	Item 3	Pearson Chi-Square	228.210	36	.000
		Likelihood Ratio	187.137	36	.000
		Linear-by-Linear Association	53.863	1	.000
	Item 4	Pearson Chi-Square	322.438	36	.000
		Likelihood Ratio	222.771	36	.000
		Linear-by-Linear Association	72.425	1	.000
Cells with expected count less than 5 range between 71.4% and 81.6%. Minimum expected count ranges between .28 and 1.11.					

Appendix K (2)

Cross Tabulations – Directional Measures (Ordinal by ordinal: Somers' d)

		Ordinal by Ordinal Somers' d	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Search Items	Item 1	Symmetric	.305	.056	5.338	.000
		Forwarder Dependent	.300	.056	5.338	.000
		Airline Dependent	.309	.056	5.338	.000
	Item 2	Symmetric	.557	.051	10.863	.000
		Forwarder Dependent	.559	.051	10.863	.000
		Airline Dependent	.554	.051	10.863	.000
	Item 3	Symmetric	.390	.054	7.042	.000
		Forwarder Dependent	.377	.053	7.042	.000
		Airline Dependent	.404	.055	7.042	.000
	Item 4	Symmetric	.443	.060	7.312	.000
		Forwarder Dependent	.447	.060	7.312	.000
		Airline Dependent	.439	.060	7.312	.000
Development Items	Item 1	Symmetric	.317	.062	5.147	.000
		Forwarder Dependent	.298	.059	5.147	.000
		Airline Dependent	.338	.065	5.147	.000
	Item 2	Symmetric	.404	.057	6.869	.000
		Forwarder Dependent	.415	.058	6.869	.000
		Airline Dependent	.394	.057	6.869	.000
	Item 3	Symmetric	.163	.063	2.547	.011
		Forwarder Dependent	.155	.061	2.547	.011
		Airline Dependent	.172	.067	2.547	.011
	Item 4	Symmetric	.404	.055	7.149	.000
		Forwarder Dependent	.410	.056	7.149	.000
		Airline Dependent	.399	.055	7.149	.000
	Item 5	Symmetric	.235	.067	3.469	.001
		Forwarder Dependent	.237	.068	3.469	.001
		Airline Dependent	.232	.067	3.469	.001

Asymp. Std. Error not assuming the null hypothesis.
Approx. T using the asymptotic standard error assuming the null hypothesis.

		Ordinal by Ordinal Somers' d	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Monitor Items	Item 1	Symmetric	.321	.064	4.995	.000
		Forwarder Dependent	.313	.062	4.995	.000
		Airline Dependent	.330	.065	4.995	.000
	Item 2	Symmetric	.404	.059	6.730	.000
		Forwarder Dependent	.402	.059	6.730	.000
		Airline Dependent	.406	.060	6.730	.000
	Item 3	Symmetric	.321	.064	4.933	.000
		Forwarder Dependent	.324	.065	4.933	.000
		Airline Dependent	.319	.064	4.933	.000
	Item 4	Symmetric	.518	.054	9.481	.000
		Forwarder Dependent	.526	.055	9.481	.000
		Airline Dependent	.510	.054	9.481	.000
	Item 5	Symmetric	.326	.069	4.665	.000
		Forwarder Dependent	.331	.070	4.665	.000
		Airline Dependent	.321	.069	4.665	.000
	Item 6	Symmetric	.360	.063	5.677	.000
		Forwarder Dependent	.362	.063	5.677	.000
		Airline Dependent	.358	.063	5.677	.000
Problem Items	Item 1	Symmetric	.456	.068	6.665	.000
		Forwarder Dependent	.449	.068	6.665	.000
		Airline Dependent	.464	.069	6.665	.000
	Item 2	Symmetric	.449	.064	6.919	.000
		Forwarder Dependent	.462	.064	6.919	.000
		Airline Dependent	.437	.063	6.919	.000
	Item 3	Symmetric	.522	.059	8.770	.000
		Forwarder Dependent	.532	.059	8.770	.000
		Airline Dependent	.511	.059	8.770	.000
Opportunism Items	Item 1	Symmetric	.607	.048	12.510	.000
		Forwarder Dependent	.606	.048	12.510	.000
		Airline Dependent	.609	.048	12.510	.000
	Item 2	Symmetric	.471	.061	7.621	.000
		Forwarder Dependent	.474	.061	7.621	.000
		Airline Dependent	.468	.061	7.621	.000
	Item 3	Symmetric	.495	.060	8.261	.000
		Forwarder Dependent	.489	.059	8.261	.000
		Airline Dependent	.500	.061	8.261	.000
	Item 4	Symmetric	.576	.056	9.902	.000
		Forwarder Dependent	.585	.057	9.902	.000
		Airline Dependent	.566	.056	9.902	.000

Asymp. Std. Error not assuming the null hypothesis.
Approx. T using the asymptotic standard error assuming the null hypothesis.

Appendix K (3)

Cross Tabulations – Symmetric Measures (ordinal by ordinal: Kendall's tau-b, Kendall's tau-c, Gamma, & Spearman Correlation)

Item		Symmetric Measures (ordinal by ordinal)	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Search Items	Item 1	Kendall's tau-b	.305	.056	5.338	.000
		Kendall's tau-c	.284	.053	5.338	.000
		Gamma	.379	.068	5.338	.000
		Spearman Correlation	.372	.068	5.283	.000
	Item 2	Kendall's tau-b	.557	.051	10.863	.000
		Kendall's tau-c	.527	.049	10.863	.000
		Gamma	.651	.057	10.863	.000
		Spearman Correlation	.647	.054	11.203	.000
	Item 3	Kendall's tau-b	.390	.054	7.042	.000
		Kendall's tau-c	.371	.053	7.042	.000
		Gamma	.468	.062	7.042	.000
		Spearman Correlation	.460	.064	6.841	.000
	Item 4	Kendall's tau-b	.443	.060	7.312	.000
		Kendall's tau-c	.434	.059	7.312	.000
		Gamma	.512	.068	7.312	.000
		Spearman Correlation	.514	.069	7.909	.000
Development Items	Item 1	Kendall's tau-b	.317	.062	5.147	.000
		Kendall's tau-c	.300	.058	5.147	.000
		Gamma	.392	.074	5.147	.000
		Spearman Correlation	.373	.073	5.307	.000
	Item 2	Kendall's tau-b	.404	.057	6.869	.000
		Kendall's tau-c	.381	.055	6.869	.000
		Gamma	.490	.066	6.869	.000
		Spearman Correlation	.477	.066	7.153	.000
	Item 3	Kendall's tau-b	.163	.063	2.547	.011
		Kendall's tau-c	.151	.059	2.547	.011
		Gamma	.203	.078	2.547	.011
		Spearman Correlation	.192	.077	2.586	.011
	Item 4	Kendall's tau-b	.404	.055	7.149	.000
		Kendall's tau-c	.376	.053	7.149	.000
		Gamma	.496	.064	7.149	.000
		Spearman Correlation	.481	.064	7.230	.000
	Item 5	Kendall's tau-b	.235	.067	3.469	.001
		Kendall's tau-c	.226	.065	3.469	.001
		Gamma	.278	.079	3.469	.001
		Spearman Correlation	.262	.082	3.576	.000

Asymp. Std. Error not assuming the null hypothesis.
Approx T using the asymptotic standard error assuming the null hypothesis.
Spearman Correlation based on normal approximation.

Item		Symmetric Measures (ordinal by ordinal)	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Monitor Items	Item 1	Kendall's tau-b	.321	.064	4.995	.000
		Kendall's tau-c	.311	.062	4.995	.000
		Gamma	.379	.073	4.995	.000
		Spearman Correlation	.371	.077	5.271	.000
	Item 2	Kendall's tau-b	.404	.059	6.730	.000
		Kendall's tau-c	.397	.059	6.730	.000
		Gamma	.470	.067	6.730	.000
		Spearman Correlation	.475	.070	7.121	.000
	Item 3	Kendall's tau-b	.321	.064	4.933	.000
		Kendall's tau-c	.311	.063	4.933	.000
		Gamma	.378	.074	4.933	.000
		Spearman Correlation	.372	.077	5.290	.000
	Item 4	Kendall's tau-b	.518	.054	9.481	.000
		Kendall's tau-c	.503	.053	9.481	.000
		Gamma	.595	.059	9.481	.000
		Spearman Correlation	.604	.060	9.994	.000
	Item 5	Kendall's tau-b	.326	.069	4.665	.000
		Kendall's tau-c	.314	.067	4.665	.000
		Gamma	.382	.080	4.665	.000
		Spearman Correlation	.359	.081	5.080	.000
	Item 6	Kendall's tau-b	.360	.063	5.677	.000
		Kendall's tau-c	.353	.062	5.677	.000
		Gamma	.418	.072	5.677	.000
		Spearman Correlation	.413	.075	5.979	.000
Problem Items	Item 1	Kendall's tau-b	.456	.068	6.665	.000
		Kendall's tau-c	.427	.064	6.665	.000
		Gamma	.536	.077	6.665	.000
		Spearman Correlation	.498	.078	7.567	.000
	Item 2	Kendall's tau-b	.449	.064	6.919	.000
		Kendall's tau-c	.421	.061	6.919	.000
		Gamma	.533	.072	6.919	.000
		Spearman Correlation	.498	.073	7.579	.000
	Item 3	Kendall's tau-b	.522	.059	8.770	.000
		Kendall's tau-c	.494	.056	8.770	.000
		Gamma	.602	.063	8.770	.000
		Spearman Correlation	.583	.065	9.476	.000

Asymp. Std. Error not assuming the null hypothesis.
Approx T using the asymptotic standard error assuming the null hypothesis.
Spearman Correlation based on normal approximation.

Item		Symmetric Measures (ordinal by ordinal)	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Opportunism Items	Item 1	Kendall's tau-b	.607	.048	12.510	.000
		Kendall's tau-c	.590	.047	12.510	.000
		Gamma	.686	.050	12.510	.000
		Spearman Correlation	.694	.051	12.701	.000
	Item 2	Kendall's tau-b	.471	.061	7.621	.000
		Kendall's tau-c	.462	.061	7.621	.000
		Gamma	.542	.068	7.621	.000
		Spearman Correlation	.540	.069	8.455	.000
	Item 3	Kendall's tau-b	.495	.060	8.261	.000
		Kendall's tau-c	.484	.059	8.261	.000
		Gamma	.565	.066	8.261	.000
		Spearman Correlation	.561	.069	8.943	.000
	Item 4	Kendall's tau-b	.576	.056	9.902	.000
		Kendall's tau-c	.534	.054	9.902	.000
		Gamma	.668	.061	9.902	.000
		Spearman Correlation	.637	.062	10.890	.000

Asymp. Std. Error not assuming the null hypothesis.
Approx T using the asymptotic standard error assuming the null hypothesis.
Spearman Correlation based on normal approximation.

Appendix K (4)

Cross Tabulations – Chi-Squared Tests (w/ amended items - 3 x 3 table)

Item		Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Search Items	Item 1	Pearson Chi-Square	29.226	4	.000
		Likelihood Ratio	38.049	4	.000
		Linear-by-Linear Association	19.430	1	.000
	Item 2	Pearson Chi-Square	92.320	4	.000
		Likelihood Ratio	91.025	4	.000
		Linear-by-Linear Association	48.759	1	.000
	Item 3	Pearson Chi-Square	56.154	4	.000
		Likelihood Ratio	55.687	4	.000
		Linear-by-Linear Association	32.804	1	.000
	Item 4	Pearson Chi-Square	70.059	4	.000
		Likelihood Ratio	65.818	4	.000
		Linear-by-Linear Association	40.000	1	.000
Cells with expected count less than 5 range between 0% and 22.2%. Minimum expected count ranges between 1.43 and 6.55.					
Development Items	Item 1	Pearson Chi-Square	29.099	4	.000
		Likelihood Ratio	34.489	4	.000
		Linear-by-Linear Association	17.424	1	.000
	Item 2	Pearson Chi-Square	44.174	4	.000
		Likelihood Ratio	40.549	4	.000
		Linear-by-Linear Association	31.786	1	.000
	Item 3	Pearson Chi-Square	23.155	4	.000
		Likelihood Ratio	24.471	4	.000
		Linear-by-Linear Association	3.854	1	***.050***
	Item 4	Pearson Chi-Square	43.382	4	.000
		Likelihood Ratio	38.431	4	.000
		Linear-by-Linear Association	32.534	1	.000
	Item 5	Pearson Chi-Square	33.727	4	.000
		Likelihood Ratio	30.838	4	.000
		Linear-by-Linear Association	8.013	1	.005
Cells with expected count less than 5 range between 22.2% and 33.3%. Minimum expected count ranges between .59 and 2.73.					

Item		Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Monitor Items	Item 1	Pearson Chi-Square	41.064	4	.000
		Likelihood Ratio	41.349	4	.000
		Linear-by-Linear Association	19.036	1	.000
	Item 2	Pearson Chi-Square	56.624	4	.000
		Likelihood Ratio	58.907	4	.000
		Linear-by-Linear Association	29.334	1	.000
	Item 3	Pearson Chi-Square	47.873	4	.000
		Likelihood Ratio	44.181	4	.000
		Linear-by-Linear Association	13.480	1	.000
	Item 4	Pearson Chi-Square	95.299	4	.000
		Likelihood Ratio	83.205	4	.000
		Linear-by-Linear Association	59.489	1	.000
	Item 5	Pearson Chi-Square	41.383	4	.000
		Likelihood Ratio	40.985	4	.000
		Linear-by-Linear Association	11.227	1	.001
	Item 6	Pearson Chi-Square	63.717	4	.000
		Likelihood Ratio	58.990	4	.000
		Linear-by-Linear Association	25.366	1	.000
Cells with expected count less than 5 range between 0% and 22.2%. Minimum expected count ranges between 2.31 and 7.53.					
Problem Items	Item 1	Pearson Chi-Square	104.831	4	.000
		Likelihood Ratio	92.409	4	.000
		Linear-by-Linear Association	32.979	1	.000
	Item 2	Pearson Chi-Square	76.775	4	.000
		Likelihood Ratio	65.489	4	.000
		Linear-by-Linear Association	28.453	1	.000
	Item 3	Pearson Chi-Square	109.656	4	.000
		Likelihood Ratio	89.392	4	.000
		Linear-by-Linear Association	54.222	1	.000
Cells with expected count less than 5 numbered 33.3%. Minimum expected count ranges between .82 and .85.					

Item		Chi-Square Tests	Value	df	Asymp. Sig. (2-sided)
Opportunism Items	Item 1	Pearson Chi-Square	119.759	4	.000
		Likelihood Ratio	112.382	4	.000
		Linear-by-Linear Association	73.928	1	.000
	Item 2	Pearson Chi-Square	76.132	4	.000
		Likelihood Ratio	66.028	4	.000
		Linear-by-Linear Association	34.428	1	.000
	Item 3	Pearson Chi-Square	85.378	4	.000
		Likelihood Ratio	86.655	4	.000
		Linear-by-Linear Association	47.274	1	.000
	Item 4	Pearson Chi-Square	80.877	4	.000
		Likelihood Ratio	62.867	4	.000
		Linear-by-Linear Association	42.302	1	.000
Cells with expected count less than 5 range between 0% and 22.2%. Minimum expected count ranges between 2.22 and 8.15.					

Appendix K (5)

Cross Tabulations – Directional Measures (Ordinal by ordinal: Somers' d) (w/ amended items resulting in 3 x 3 table)

Ordinal by Ordinal Somers' d			Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Search Items	Item 1	Symmetric	.293	.062	4.548	.000
		Forwarder Dependent	.297	.065	4.548	.000
		Airline Dependent	.289	.060	4.548	.000
	Item 2	Symmetric	.545	.068	8.053	.000
		Forwarder Dependent	.551	.069	8.053	.000
		Airline Dependent	.540	.068	8.053	.000
	Item 3	Symmetric	.390	.063	5.881	.000
		Forwarder Dependent	.373	.061	5.881	.000
		Airline Dependent	.409	.065	5.881	.000
	Item 4	Symmetric	.450	.065	6.648	.000
		Forwarder Dependent	.466	.068	6.648	.000
		Airline Dependent	.435	.064	6.648	.000
Development Items	Item 1	Symmetric	.320	.059	5.231	.000
		Forwarder Dependent	.286	.055	5.231	.000
		Airline Dependent	.363	.067	5.231	.000
	Item 2	Symmetric	.384	.062	5.844	.000
		Forwarder Dependent	.406	.065	5.844	.000
		Airline Dependent	.364	.061	5.844	.000
	Item 3	Symmetric	.123	.073	1.663	***.096***
		Forwarder Dependent	.121	.072	1.663	***.096***
		Airline Dependent	.125	.075	1.663	***.096***
	Item 4	Symmetric	.404	.062	6.024	.000
		Forwarder Dependent	.404	.064	6.024	.000
		Airline Dependent	.404	.062	6.024	.000
	Item 5	Symmetric	.176	.078	2.229	.026
		Forwarder Dependent	.179	.079	2.229	.026
		Airline Dependent	.173	.077	2.229	.026

Asymp. Std. Error not assuming the null hypothesis.
Approx. T using the asymptotic standard error assuming the null hypothesis.

Ordinal by Ordinal Somers' d			Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Monitor Items	Item 1	Symmetric	.292	.067	4.229	.000
		Forwarder Dependent	.278	.064	4.229	.000
		Airline Dependent	.307	.071	4.229	.000
	Item 2	Symmetric	.365	.066	5.348	.000
		Forwarder Dependent	.370	.066	5.348	.000
		Airline Dependent	.359	.066	5.348	.000
	Item 3	Symmetric	.247	.080	3.021	.003
		Forwarder Dependent	.257	.083	3.021	.003
		Airline Dependent	.238	.078	3.021	.003
	Item 4	Symmetric	.558	.059	8.773	.000
		Forwarder Dependent	.583	.062	8.773	.000
		Airline Dependent	.535	.059	8.773	.000
	Item 5	Symmetric	.251	.076	3.281	.001
		Forwarder Dependent	.265	.080	3.281	.001
		Airline Dependent	.239	.073	3.281	.001
	Item 6	Symmetric	.349	.074	4.618	.000
		Forwarder Dependent	.359	.075	4.618	.000
		Airline Dependent	.340	.073	4.618	.000
Problem Items	Item 1	Symmetric	.440	.078	5.577	.000
		Forwarder Dependent	.431	.079	5.577	.000
		Airline Dependent	.450	.078	5.577	.000
	Item 2	Symmetric	.382	.070	5.264	.000
		Forwarder Dependent	.402	.073	5.264	.000
		Airline Dependent	.363	.069	5.264	.000
	Item 3	Symmetric	.538	.064	8.008	.000
		Forwarder Dependent	.567	.065	8.008	.000
		Airline Dependent	.513	.064	8.008	.000
Opportunism Items	Item 1	Symmetric	.628	.054	10.666	.000
		Forwarder Dependent	.623	.056	10.666	.000
		Airline Dependent	.633	.055	10.666	.000
	Item 2	Symmetric	.421	.076	5.241	.000
		Forwarder Dependent	.431	.078	5.241	.000
		Airline Dependent	.411	.076	5.241	.000
	Item 3	Symmetric	.503	.063	7.801	.000
		Forwarder Dependent	.501	.063	7.801	.000
		Airline Dependent	.504	.065	7.801	.000
	Item 4	Symmetric	.468	.076	5.266	.000
		Forwarder Dependent	.486	.080	5.266	.000
		Airline Dependent	.451	.077	5.266	.000

Asymp. Std. Error not assuming the null hypothesis.
Approx. T using the asymptotic standard error assuming the null hypothesis.

Appendix K (6)

Cross Tabulations – Symmetric Measures (Ordinal by ordinal: Kendall's tau-b, Kendall's tau-c, Gamma, & Spearman Correlation) (w/ amended items resulting in 3 x 3 table)

Item		Symmetric Measures (ordinal by ordinal)	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Search Items	Item 1	Kendall's tau-b	.293	.062	4.548	.000
		Kendall's tau-c	.261	.057	4.548	.000
		Gamma	.487	.097	4.548	.000
		Spearman Correlation	.315	.067	4.379	.000
	Item 2	Kendall's tau-b	.545	.068	8.053	.000
		Kendall's tau-c	.470	.058	8.053	.000
		Gamma	.736	.076	8.053	.000
		Spearman Correlation	.569	.069	9.117	.000
	Item 3	Kendall's tau-b	.391	.063	5.881	.000
		Kendall's tau-c	.347	.059	5.881	.000
		Gamma	.610	.086	5.881	.000
		Spearman Correlation	.411	.067	5.951	.000
	Item 4	Kendall's tau-b	.450	.066	6.648	.000
		Kendall's tau-c	.422	.063	6.648	.000
		Gamma	.641	.082	6.648	.000
		Spearman Correlation	.478	.069	7.173	.000
Development Items	Item 1	Kendall's tau-b	.322	.059	5.231	.000
		Kendall's tau-c	.255	.049	5.231	.000
		Gamma	.576	.093	5.231	.000
		Spearman Correlation	.340	.062	4.764	.000
	Item 2	Kendall's tau-b	.384	.063	5.844	.000
		Kendall's tau-c	.339	.058	5.844	.000
		Gamma	.612	.085	5.844	.000
		Spearman Correlation	.407	.066	5.883	.000
	Item 3	Kendall's tau-b	.123	.073	1.663	***.096***
		Kendall's tau-c	.102	.062	1.663	***.096***
		Gamma	.212	.125	1.663	***.096***
		Spearman Correlation	.128	.077	1.708	***.089***
	Item 4	Kendall's tau-b	.404	.062	6.024	.000
		Kendall's tau-c	.327	.054	6.024	.000
		Gamma	.682	.085	6.024	.000
		Spearman Correlation	.422	.065	6.144	.000
	Item 5	Kendall's tau-b	.176	.078	2.229	***.026***
		Kendall's tau-c	.153	.069	2.229	***.026***
		Gamma	.280	.121	2.229	***.026***
		Spearman Correlation	.183	.082	2.461	***.015***

For previous table:

Asymp. Std. Error not assuming the null hypothesis.
Approx T using the asymptotic standard error assuming the null hypothesis.
Spearman Correlation based on normal approximation.

Item		Symmetric Measures (ordinal by ordinal)	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Monitor Items	Item 1	Kendall's tau-b	.292	.067	4.229	.000
		Kendall's tau-c	.267	.063	4.229	.000
		Gamma	.456	.099	4.229	.000
		Spearman Correlation	.310	.072	4.294	.000
	Item 2	Kendall's tau-b	.365	.066	5.348	.000
		Kendall's tau-c	.349	.065	5.348	.000
		Gamma	.532	.087	5.348	.000
		Spearman Correlation	.389	.071	5.563	.000
	Item 3	Kendall's tau-b	.247	.080	3.021	.003
		Kendall's tau-c	.216	.071	3.021	.003
		Gamma	.375	.117	3.021	.003
		Spearman Correlation	.258	.084	3.519	.001
	Item 4	Kendall's tau-b	.558	.059	8.773	.000
		Kendall's tau-c	.493	.056	8.773	.000
		Gamma	.791	.064	8.773	.000
		Spearman Correlation	.583	.061	9.469	.000
	Item 5	Kendall's tau-b	.251	.076	3.281	.001
		Kendall's tau-c	.225	.068	3.281	.001
		Gamma	.381	.111	3.281	.001
		Spearman Correlation	.265	.080	3.627	.000
	Item 6	Kendall's tau-b	.349	.074	4.618	.000
		Kendall's tau-c	.327	.071	4.618	.000
		Gamma	.501	.099	4.618	.000
		Spearman Correlation	.368	.078	5.215	.000
Problem Items	Item 1	Kendall's tau-b	.440	.078	5.577	.000
		Kendall's tau-c	.364	.065	5.577	.000
		Gamma	.612	.096	5.577	.000
		Spearman Correlation	.451	.079	6.658	.000
	Item 2	Kendall's tau-b	.382	.070	5.264	.000
		Kendall's tau-c	.320	.061	5.264	.000
		Gamma	.589	.094	5.264	.000
		Spearman Correlation	.394	.072	5.652	.000
	Item 3	Kendall's tau-b	.539	.065	8.008	.000
		Kendall's tau-c	.456	.057	8.008	.000
		Gamma	.764	.070	8.008	.000
		Spearman Correlation	.554	.066	8.776	.000

Asymp. Std. Error not assuming the null hypothesis.
Approx T using the asymptotic standard error assuming the null hypothesis.
Spearman Correlation based on normal approximation.

Item		Symmetric Measures (ordinal by ordinal)	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Opportunism Items	Item 1	Kendall's tau-b	.628	.054	10.666	.000
		Kendall's tau-c	.570	.053	10.666	.000
		Gamma	.837	.052	10.666	.000
		Spearman Correlation	.656	.055	11.475	.000
	Item 2	Kendall's tau-b	.421	.076	5.241	.000
		Kendall's tau-c	.366	.070	5.241	.000
		Gamma	.601	.099	5.241	.000
		Spearman Correlation	.442	.079	6.492	.000
	Item 3	Kendall's tau-b	.503	.063	7.801	.000
		Kendall's tau-c	.481	.062	7.801	.000
		Gamma	.689	.075	7.801	.000
		Spearman Correlation	.534	.066	8.338	.000
	Item 4	Kendall's tau-b	.468	.076	5.266	.000
		Kendall's tau-c	.326	.062	5.266	.000
		Gamma	.733	.097	5.266	.000
		Spearman Correlation	.484	.078	7.305	.000

Asymp. Std. Error not assuming the null hypothesis.
Approx T using the asymptotic standard error assuming the null hypothesis.
Spearman Correlation based on normal approximation.

Appendix L (1)

Paired samples correlations

TC Pairs		Correlation	Sig.
Search	Item 1	.385	.000
	Item 2	.605	.000
	Item 3	.490	.000
	Item 4	.520	.000
Development	Item 1	.338	.000
	Item 2	.517	.000
	Item 3	.227	*.002*
	Item 4	.493	.000
	Item 5	.309	.000
Monitor	Item 1	.406	.000
	Item 2	.506	.000
	Item 3	.392	.000
	Item 4	.601	.000
	Item 5	.382	.000
	Item 6	.421	.000
Problem	Item 1	.449	.000
	Item 2	.518	.000
	Item 3	.597	.000
Opportunism	Item 1	.692	.000
	Item 2	.553	.000
	Item 3	.555	.000
	Item 4	.643	.000

Appendix L (2)

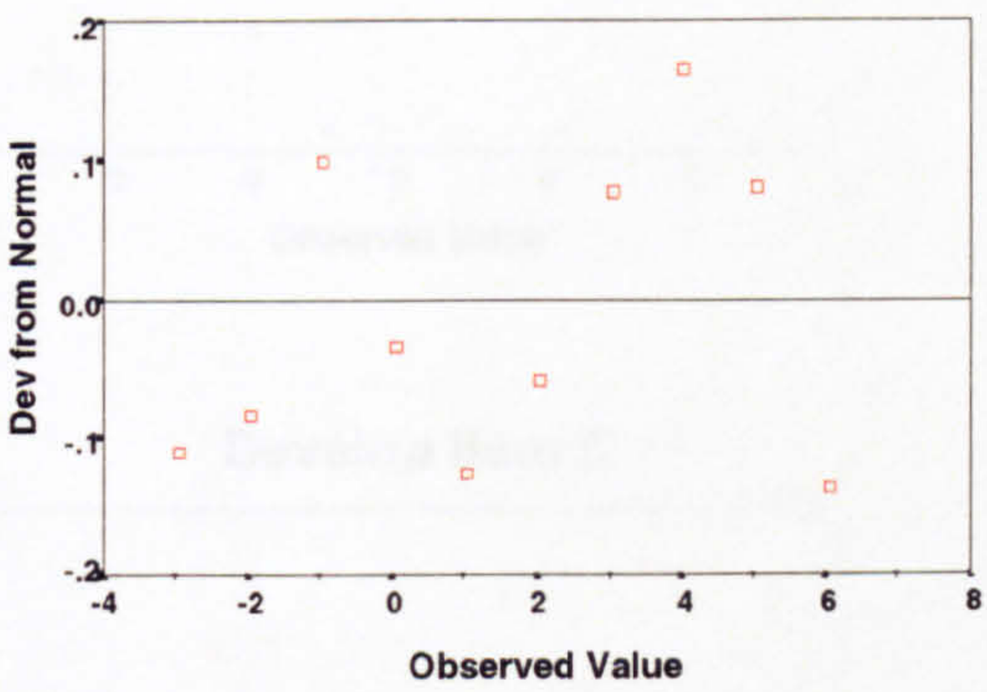
T tests

TC Pairs		Paired Differences					t	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Search	Item 1	-1.93	1.98	.15	-2.23	-1.64	-12.971	.000
	Item 2	-.24	1.42	.11	-.45	-.03	-2.226	*.027*
	Item 3	-1.22	1.73	.13	-1.47	-.96	-9.306	.000
	Item 4	-.67	1.76	.13	-.93	-.41	-5.041	.000
Development	Item 1	-1.13	1.82	.14	-1.40	-.86	-8.254	.000
	Item 2	-.94	1.64	.12	-1.18	-.69	-7.587	.000
	Item 3	-1.59	1.94	.15	-1.87	-1.30	-10.840	.000
	Item 4	-.74	1.52	.11	-.96	-.51	-6.450	.000
	Item 5	-1.09	1.92	.14	-1.37	-.80	-7.507	.000
Monitor	Item 1	-1.36	2.00	.15	-1.66	-1.07	-9.041	.000
	Item 2	-.87	1.88	.14	-1.15	-.59	-6.137	.000
	Item 3	-.76	1.85	.14	-1.04	-.49	-5.455	.000
	Item 4	-.36	1.57	.12	-.59	-.12	-3.021	.003
	Item 5	-.66	1.88	.14	-.94	-.38	-4.655	.000
	Item 6	-.74	1.94	.15	-1.03	-.46	-5.079	.000
Problem	Item 1	-.47	1.59	.12	-.71	-.24	-3.937	.000
	Item 2	-.80	1.49	.11	-1.02	-.57	-7.081	.000
	Item 3	-.55	1.43	.11	-.76	-.33	-5.048	.000
Opportunism	Item 1	-.38	1.41	.11	-.59	-.17	-3.574	.000
	Item 2	-.28	1.63	.12	-.52	-.04	-2.260	*.025*
	Item 3	-.42	1.80	.14	-.69	-.15	-3.094	.002
	Item 4	-.43	1.25	.09	-.61	-.24	-4.526	.000
df = 175								

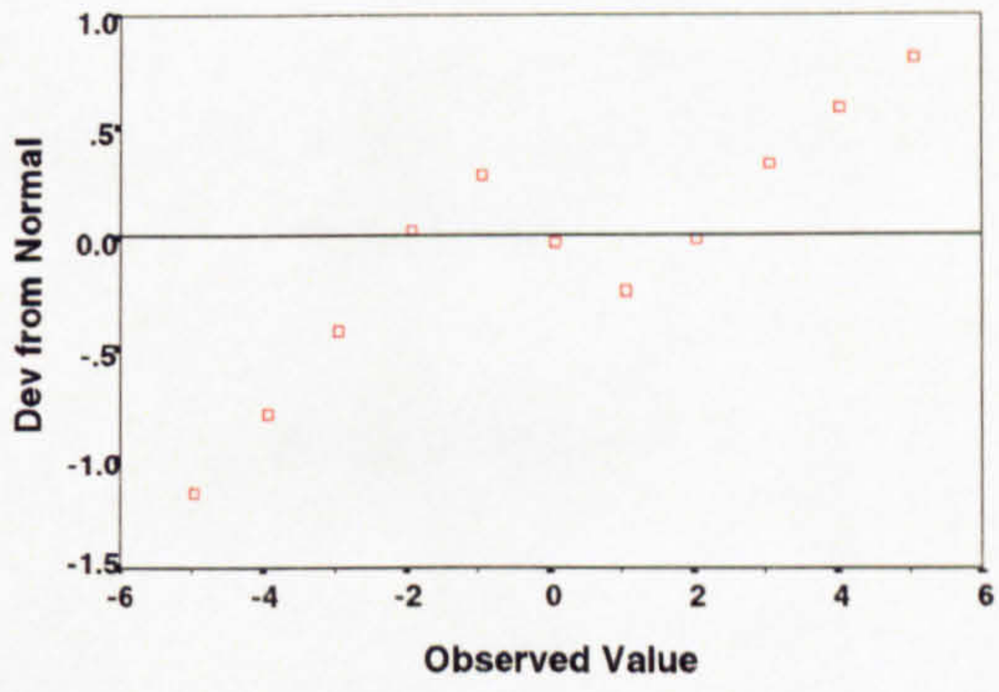
Appendix L (3)

Detrended Normal Q-Q Plots of TC Item Differences

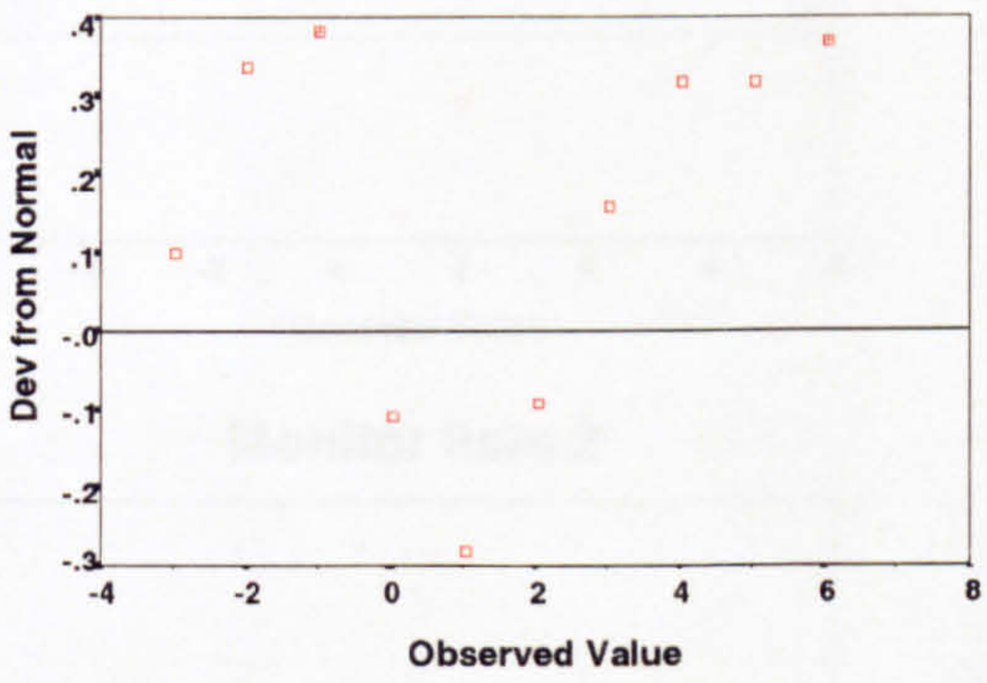
Search Item 1



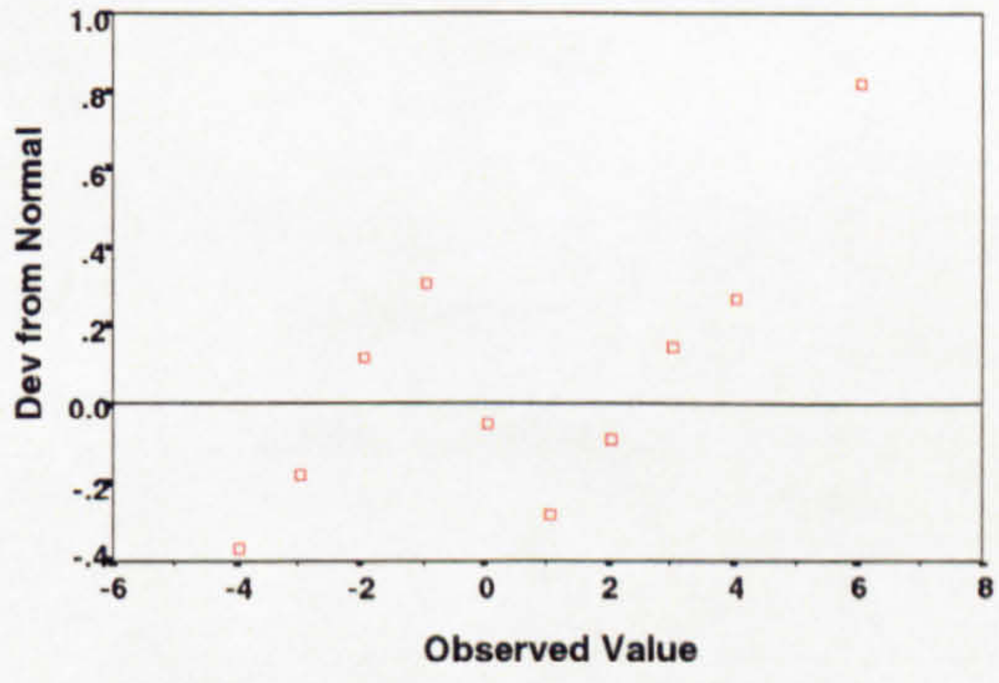
Search Item 2



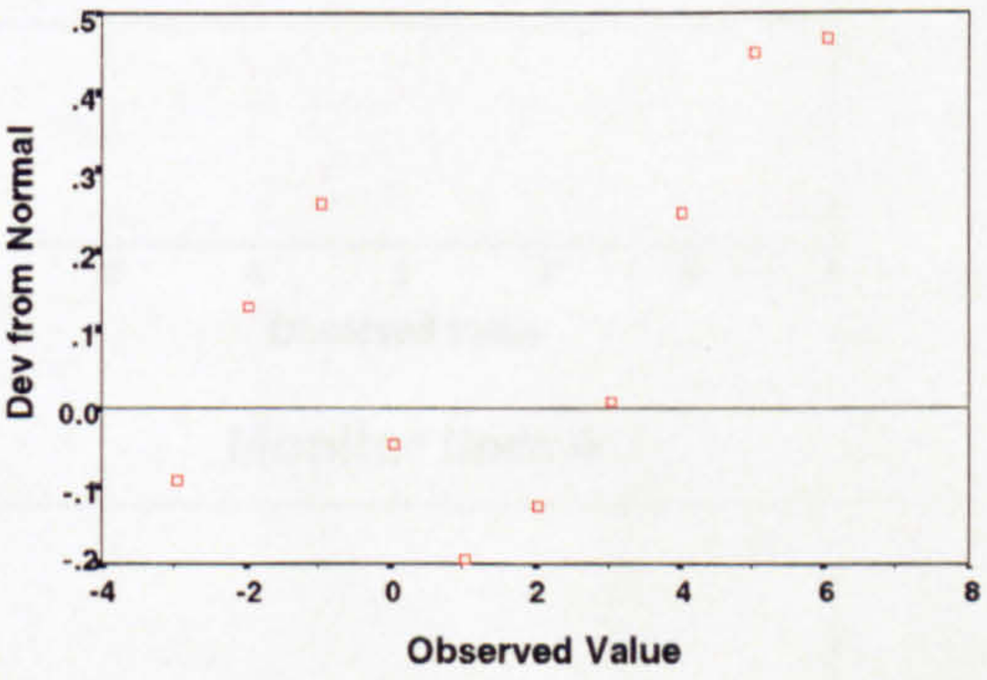
Search Item 3



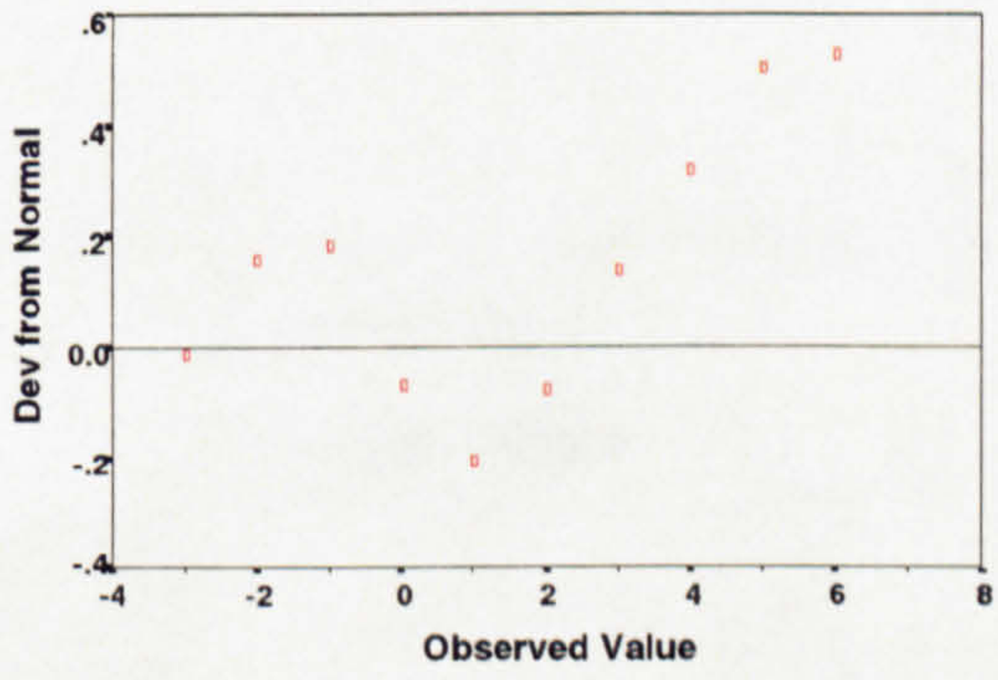
Search Item 4



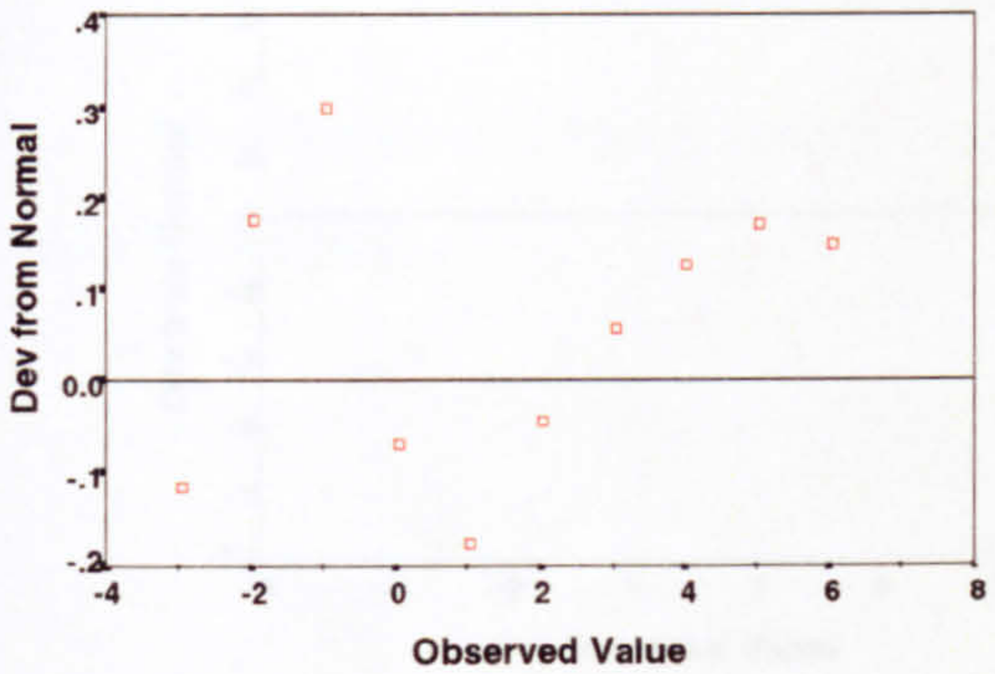
Develop Item 1



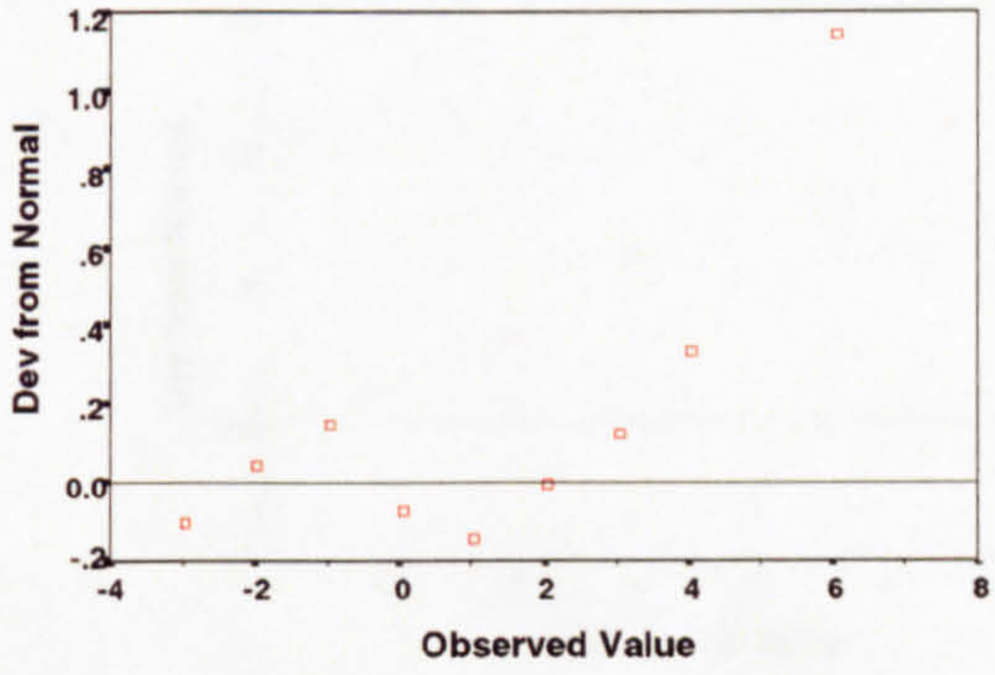
Develop Item 2



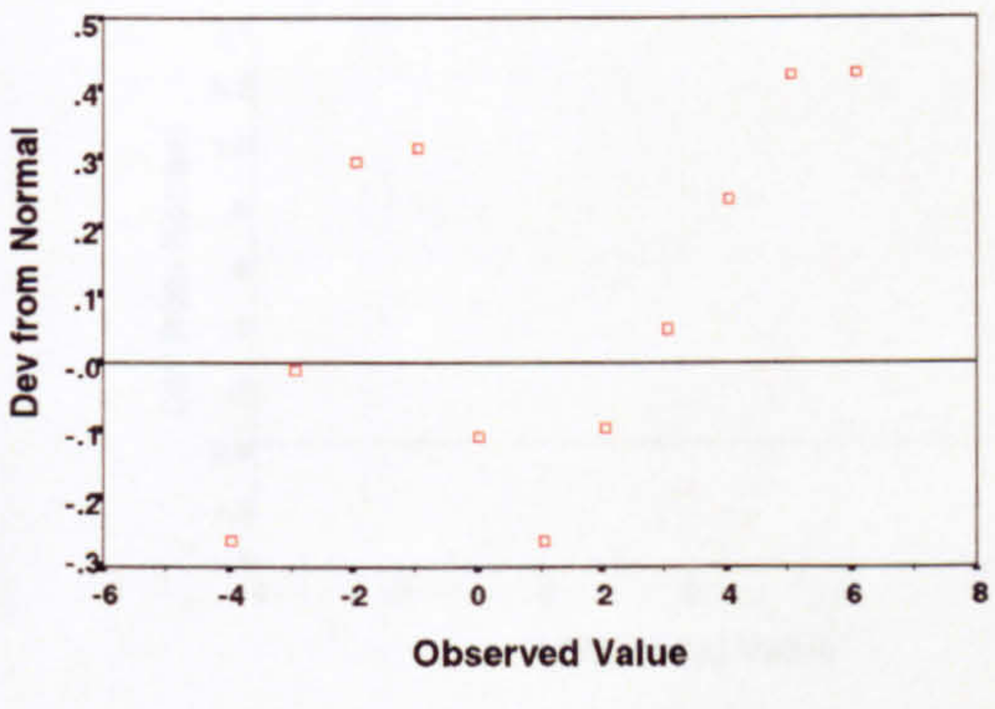
Develop Item 3



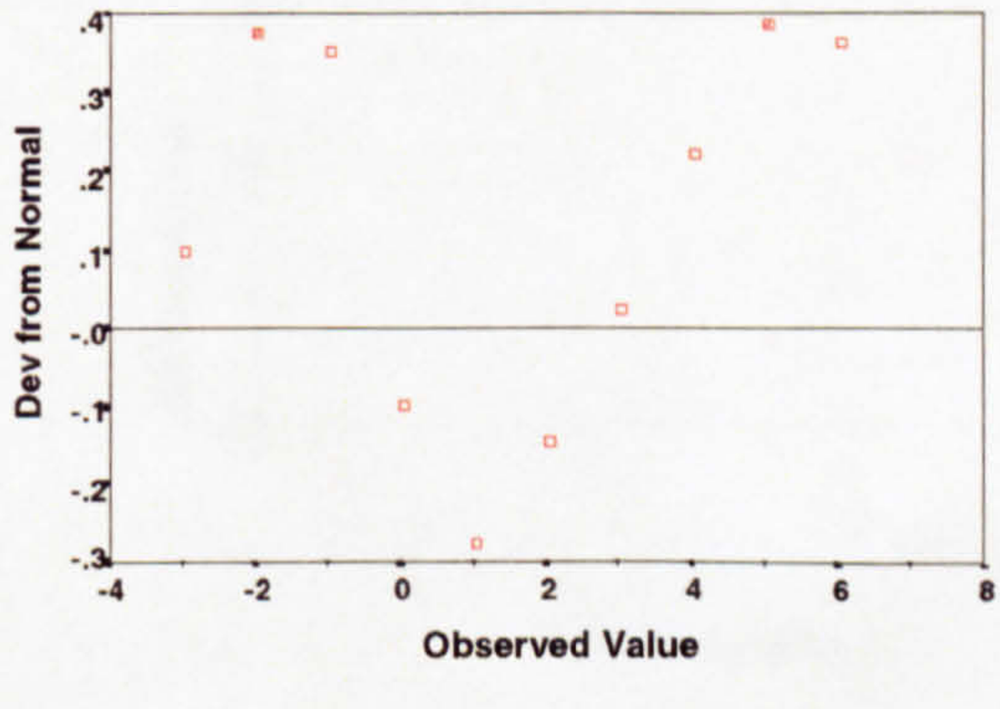
Develop Item 4



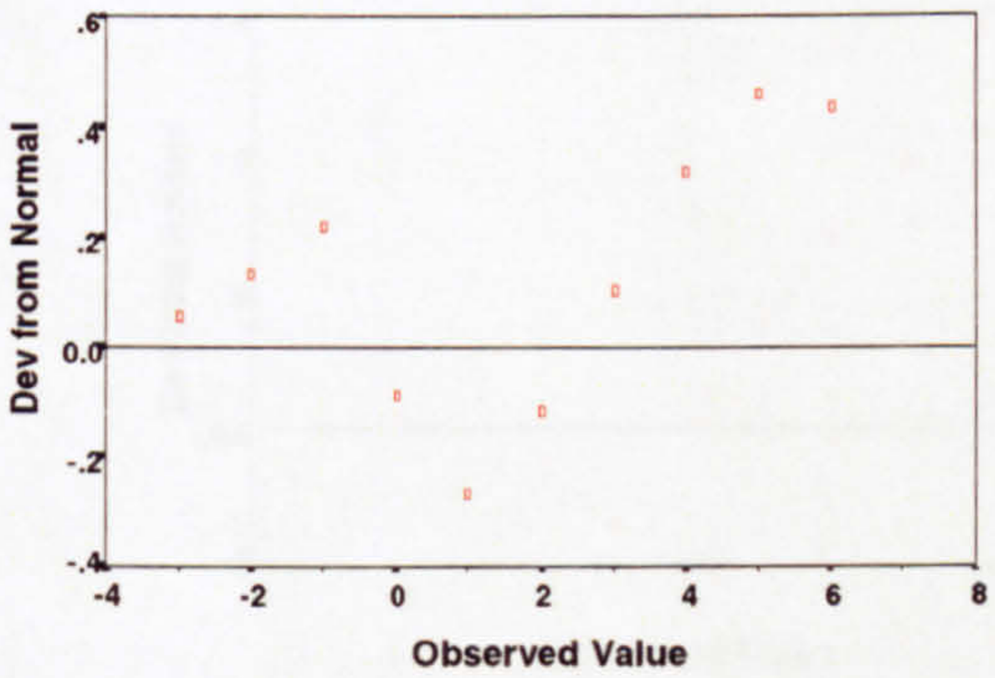
Develop Item 5



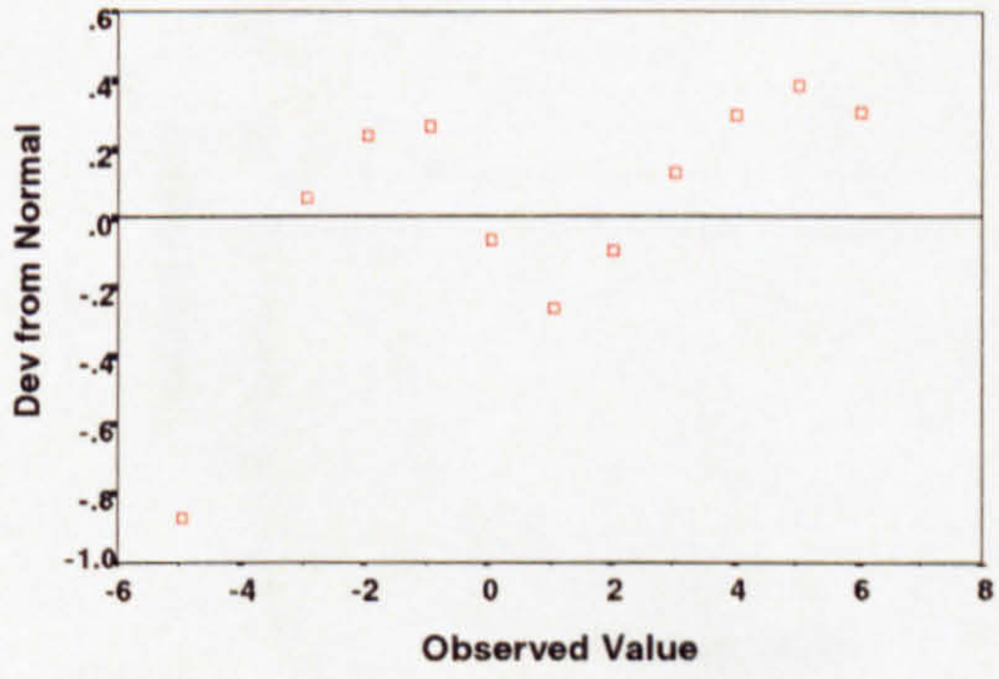
Monitor Item 1



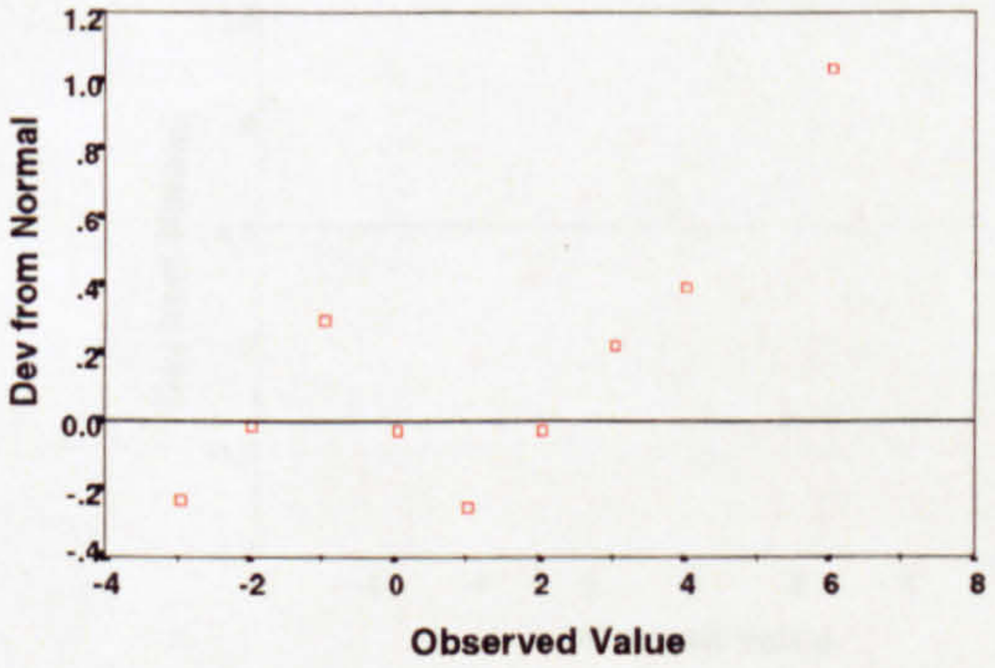
Monitor Item 2



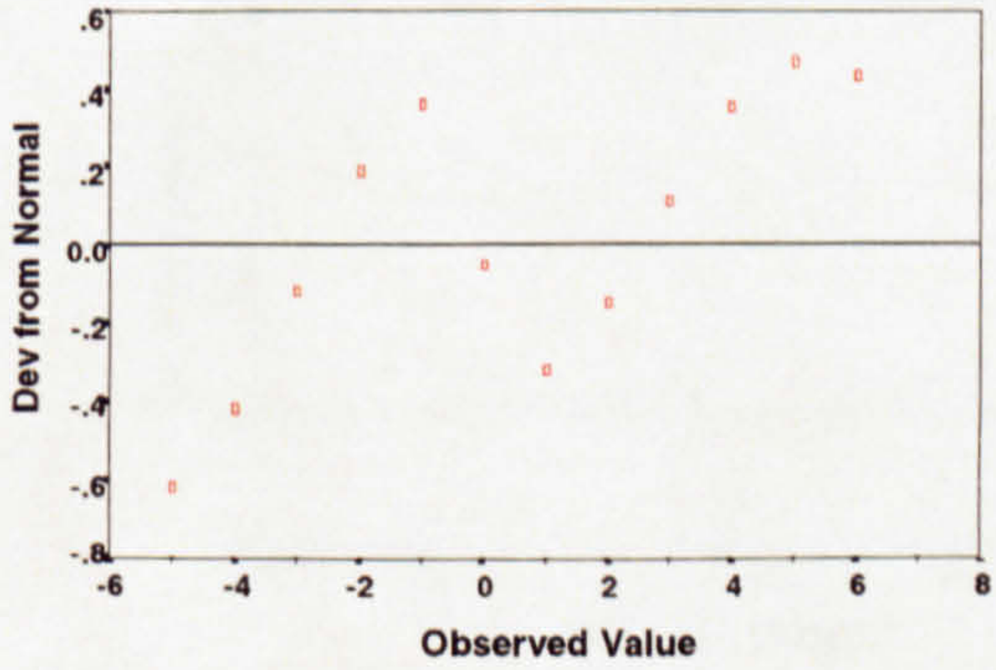
Monitor Item 3

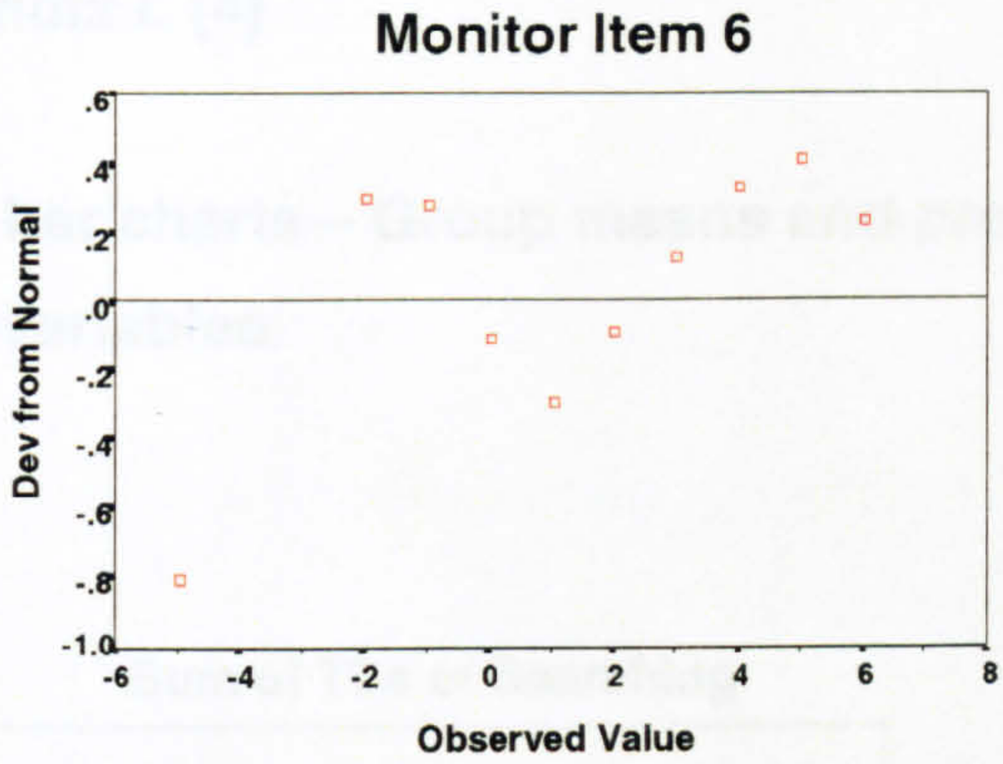


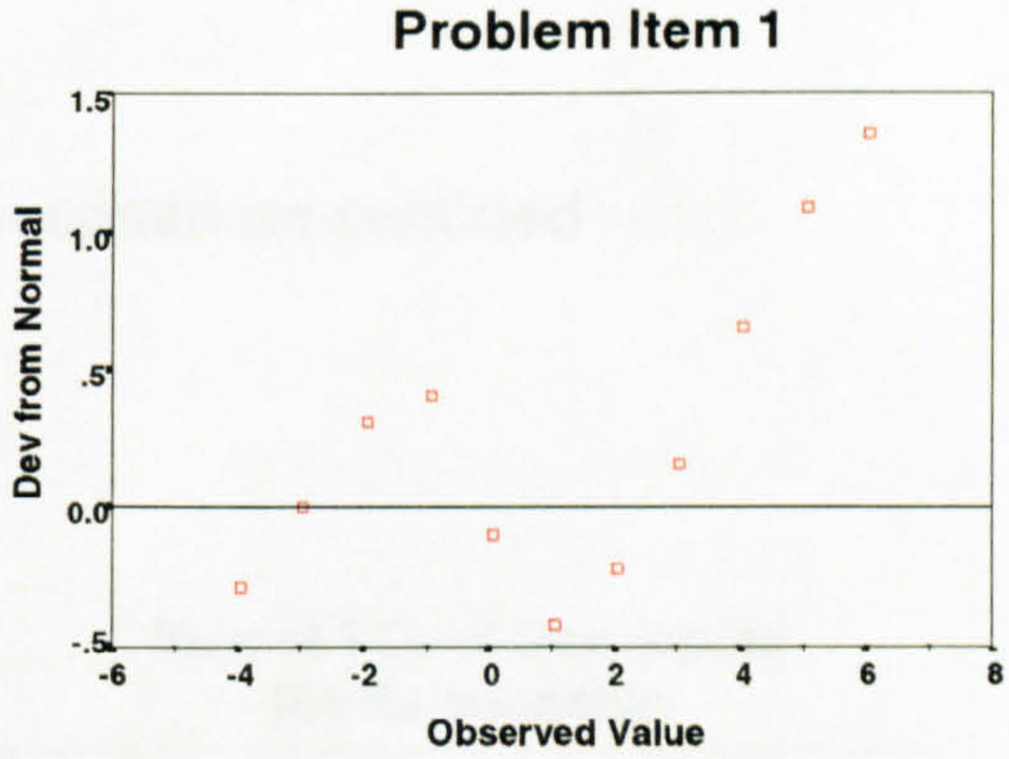
Monitor Item 4

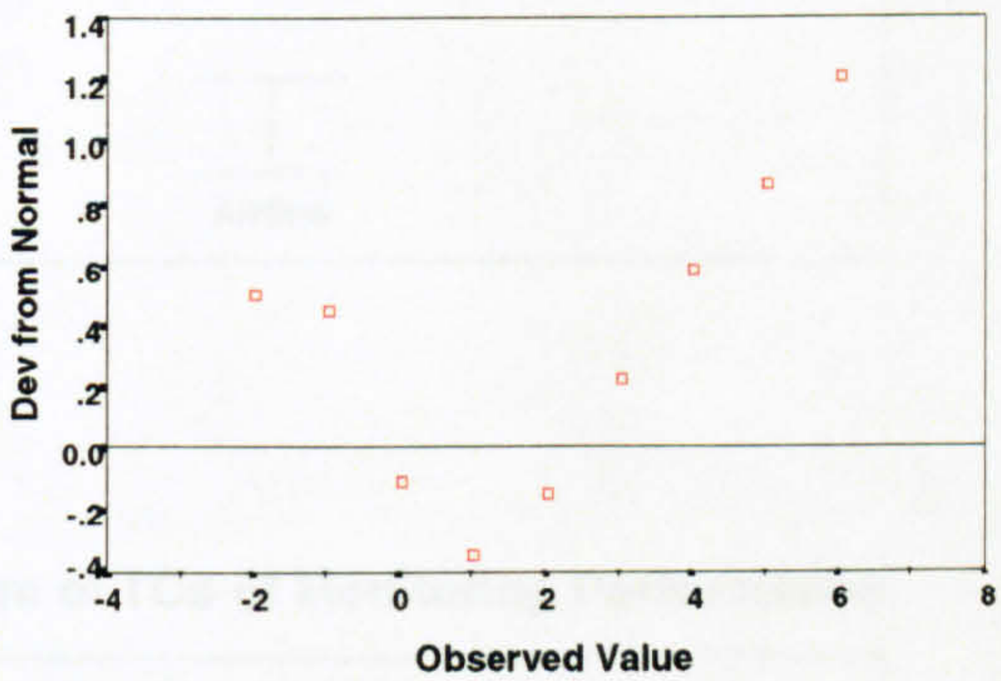


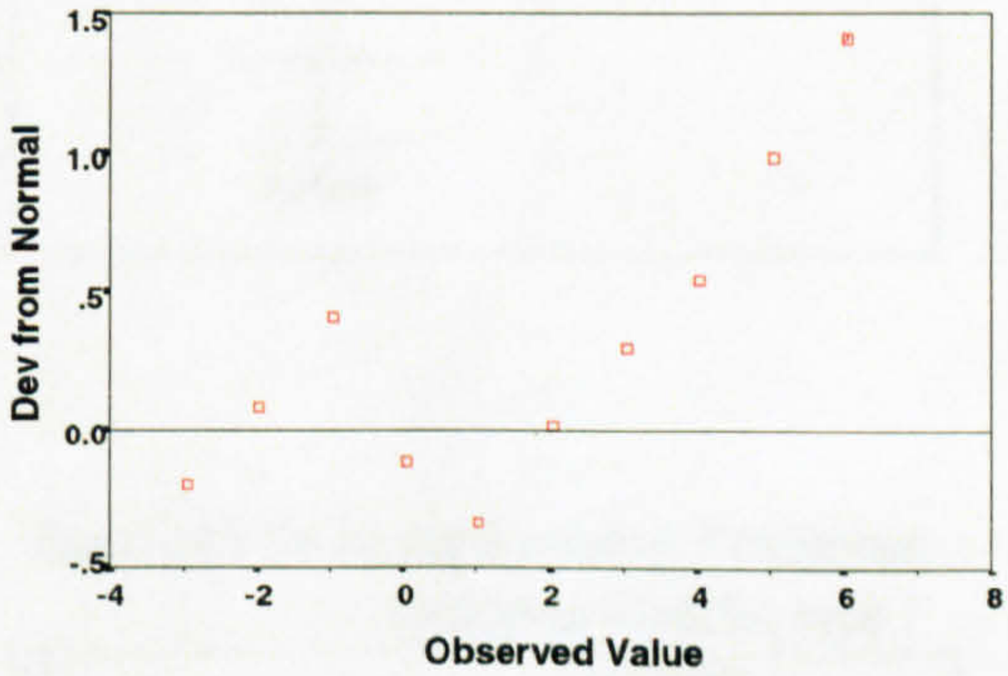
Monitor Item 5

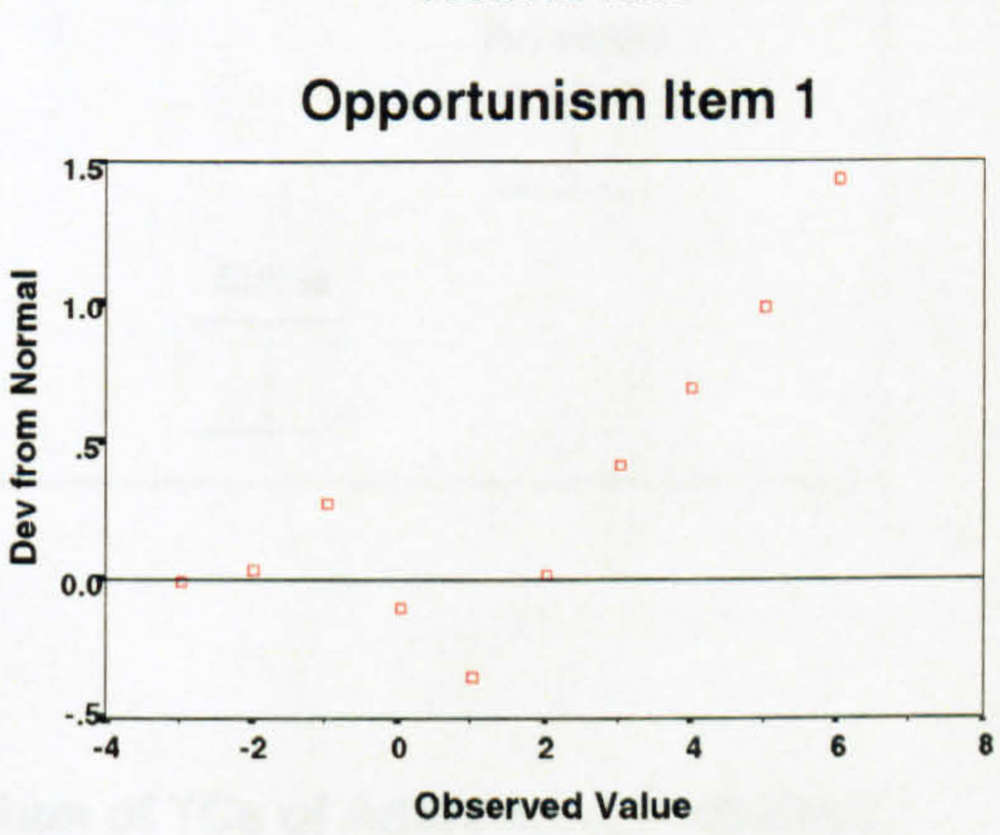


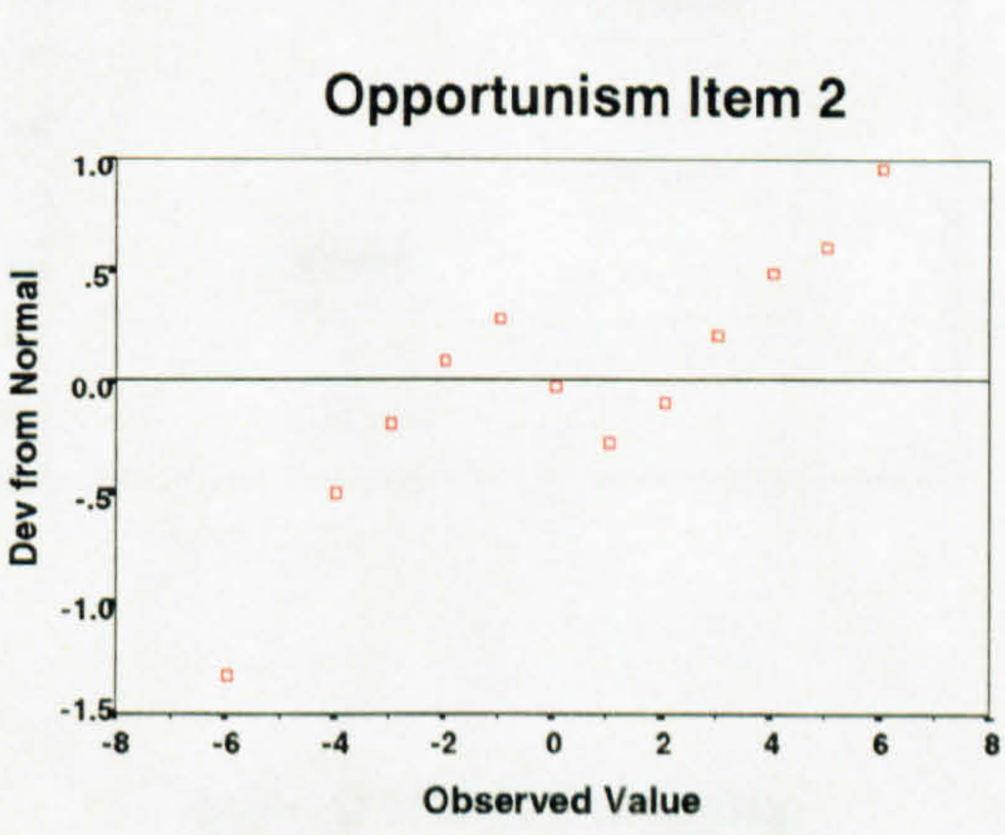

Monitor Item 6
Dev from Normal
.6
.4
.2
.0
-.2
-.4
-.6
-.8
-1.0
-6
-4
-2
0
2
4
6
8
Observed Value

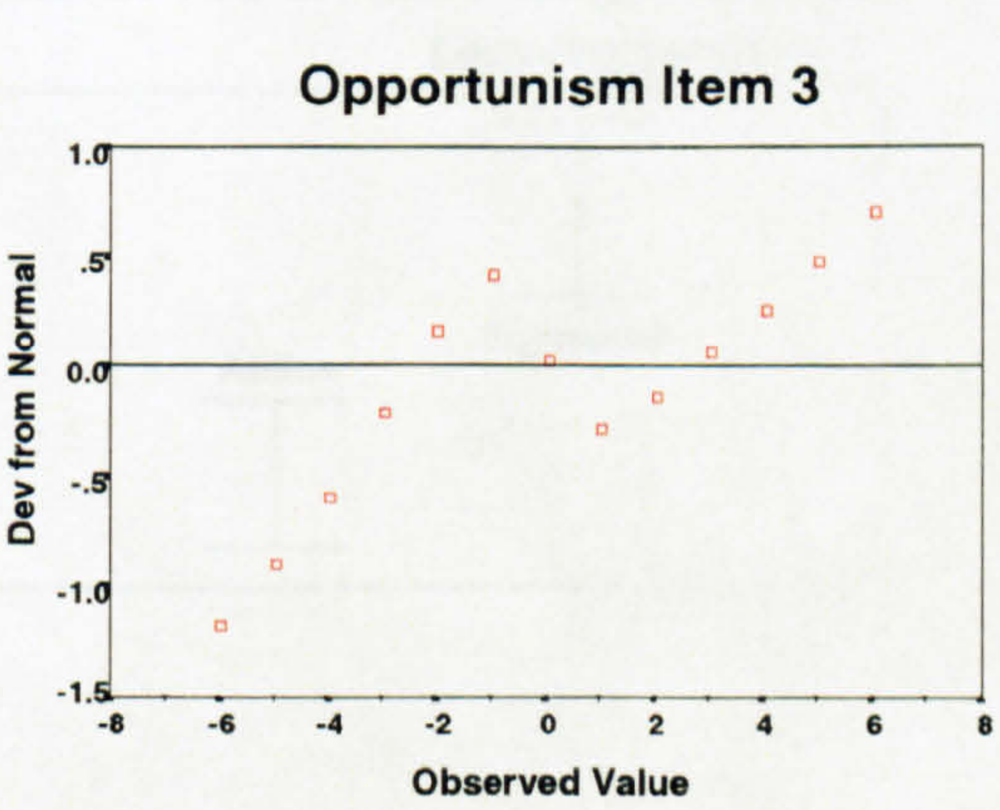

Problem Item 1
Dev from Normal
1.5
1.0
.5
0.0
-.5
-6
-4
-2
0
2
4
6
8
Observed Value

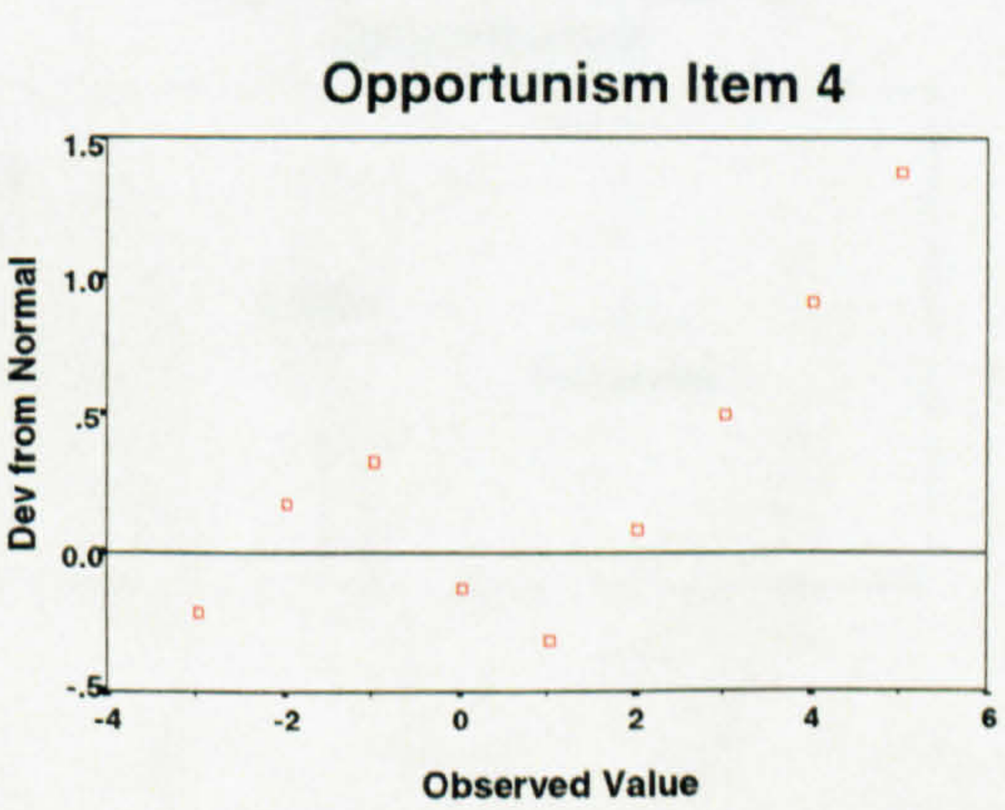

Problem Item 2
Dev from Normal
1.4
1.2
1.0
.8
.6
.4
.2
0.0
-.2
-.4
-4
-2
0
2
4
6
8
Observed Value


Problem Item 3
Dev from Normal
1.5
1.0
.5
0.0
-.5
-4
-2
0
2
4
6
8
Observed Value


Opportunism Item 1
Dev from Normal
1.5
1.0
.5
0.0
-.5
-4
-2
0
2
4
6
8
Observed Value

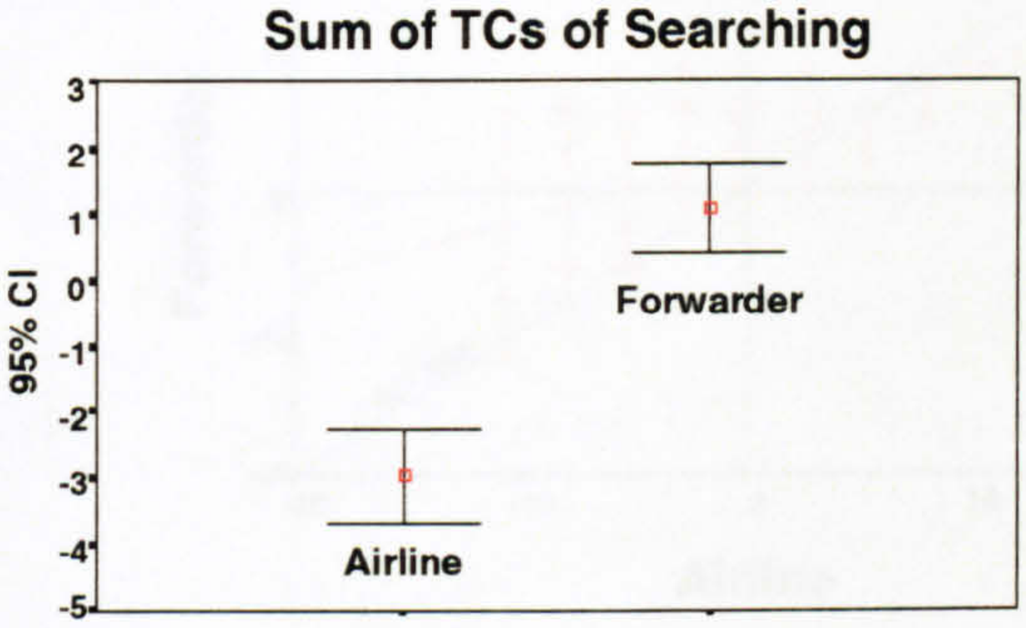

Opportunism Item 2
Dev from Normal
1.0
.5
0.0
-.5
-1.0
-1.5
-8
-6
-4
-2
0
2
4
6
8
Observed Value

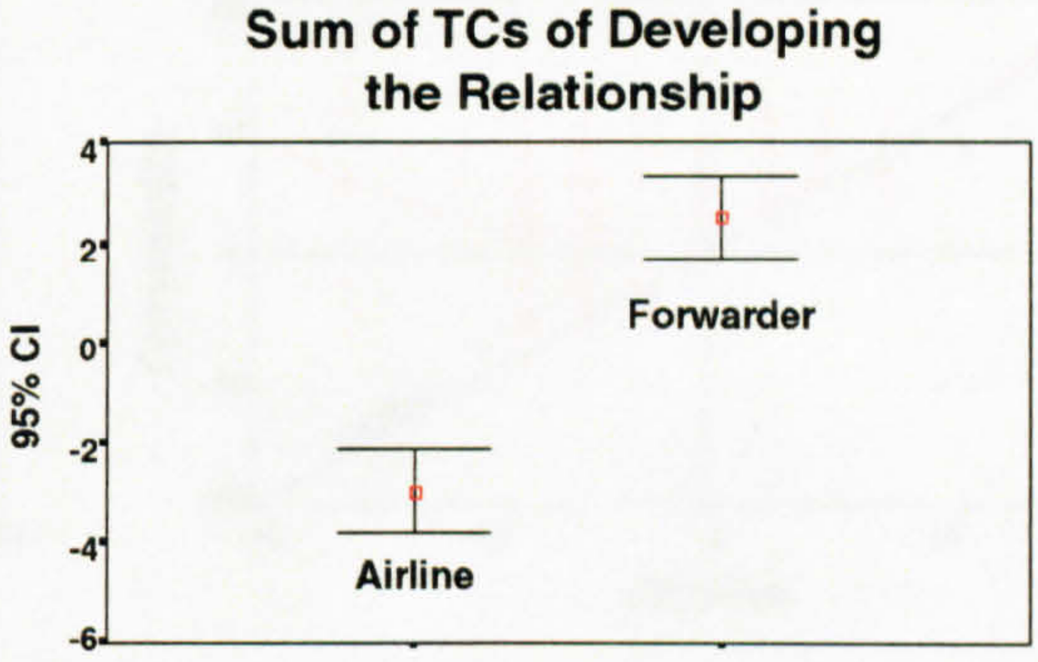

Opportunism Item 3
Dev from Normal
1.0
.5
0.0
-.5
-1.0
-1.5
-8
-6
-4
-2
0
2
4
6
8
Observed Value

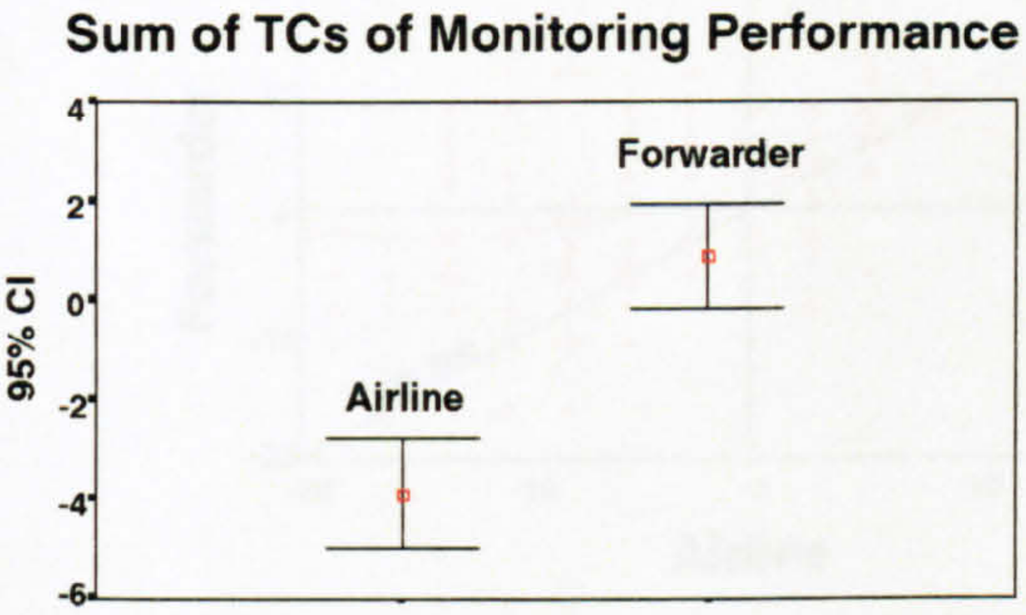

Opportunism Item 4
Dev from Normal
1.5
1.0
.5
0.0
-.5
-4
-2
0
2
4
6
Observed Value

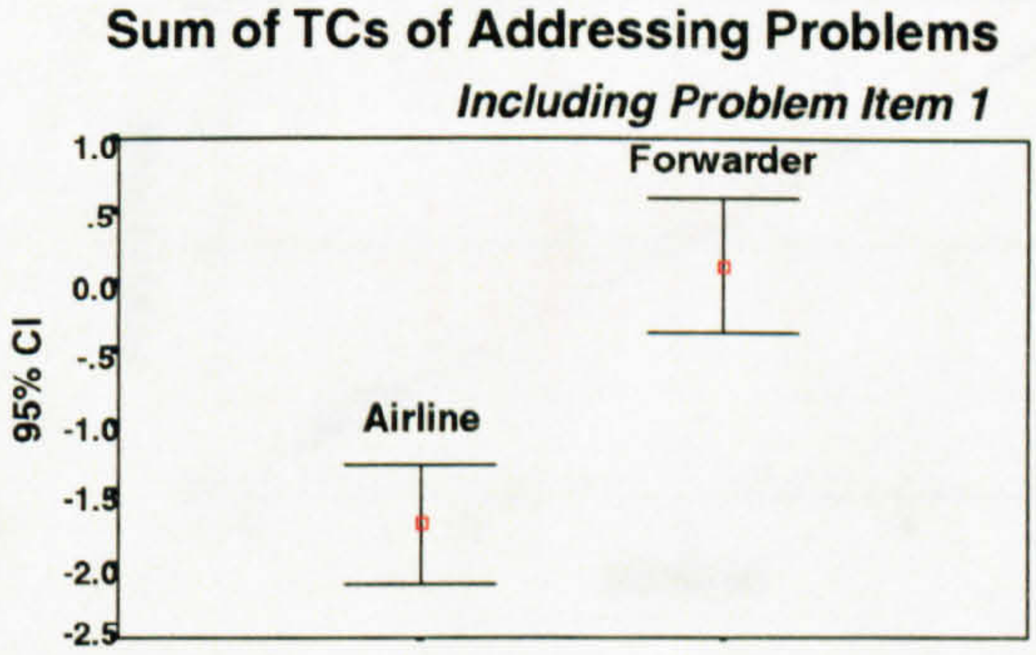
Appendix L (4)

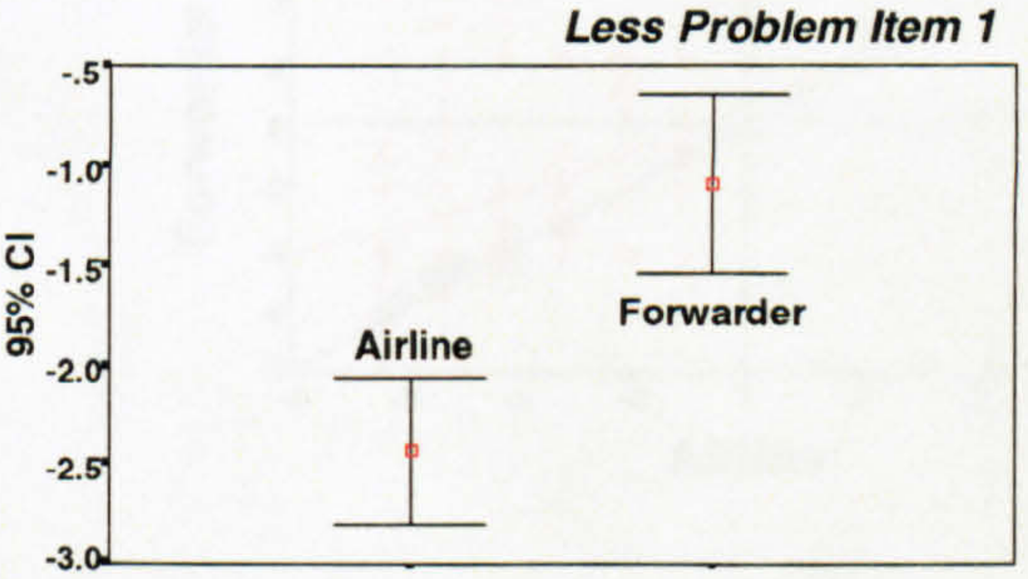
Error bar charts – Group means and precision based on summed meta-variables

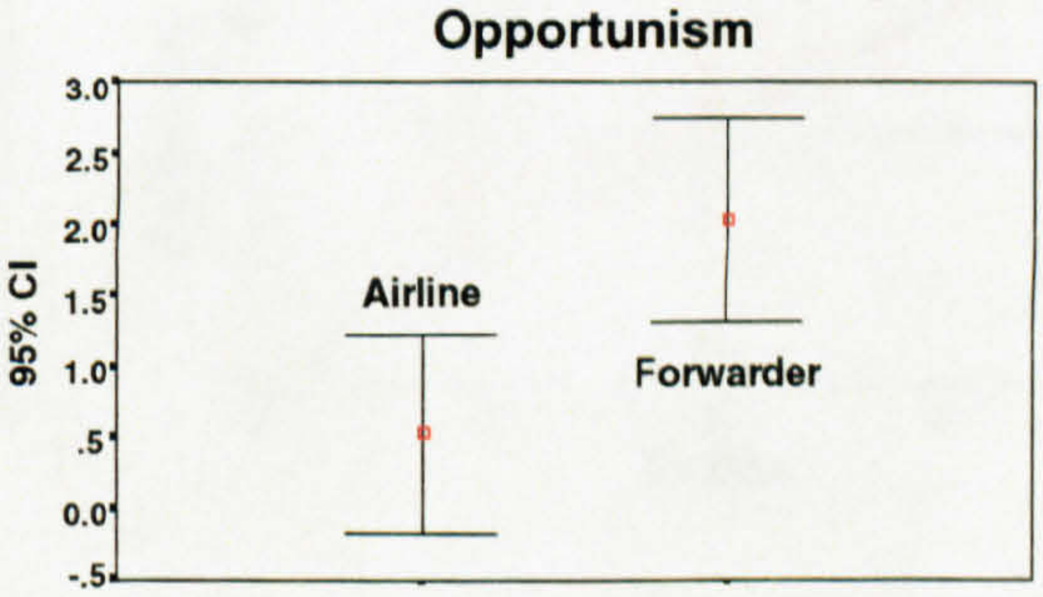








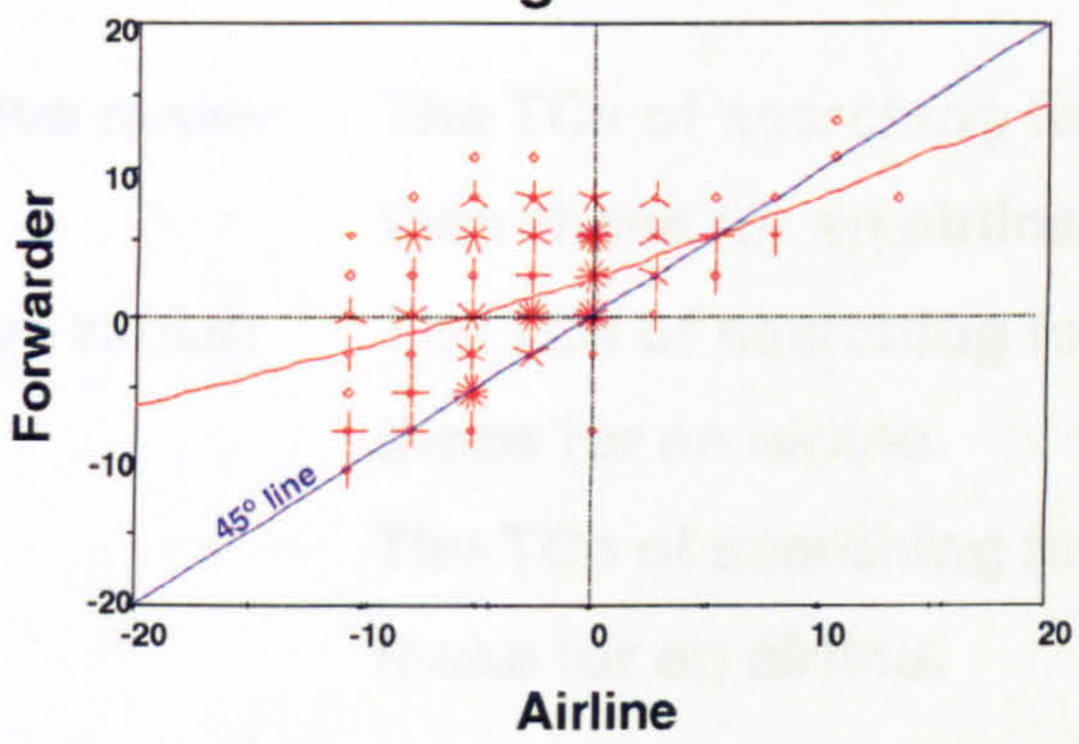




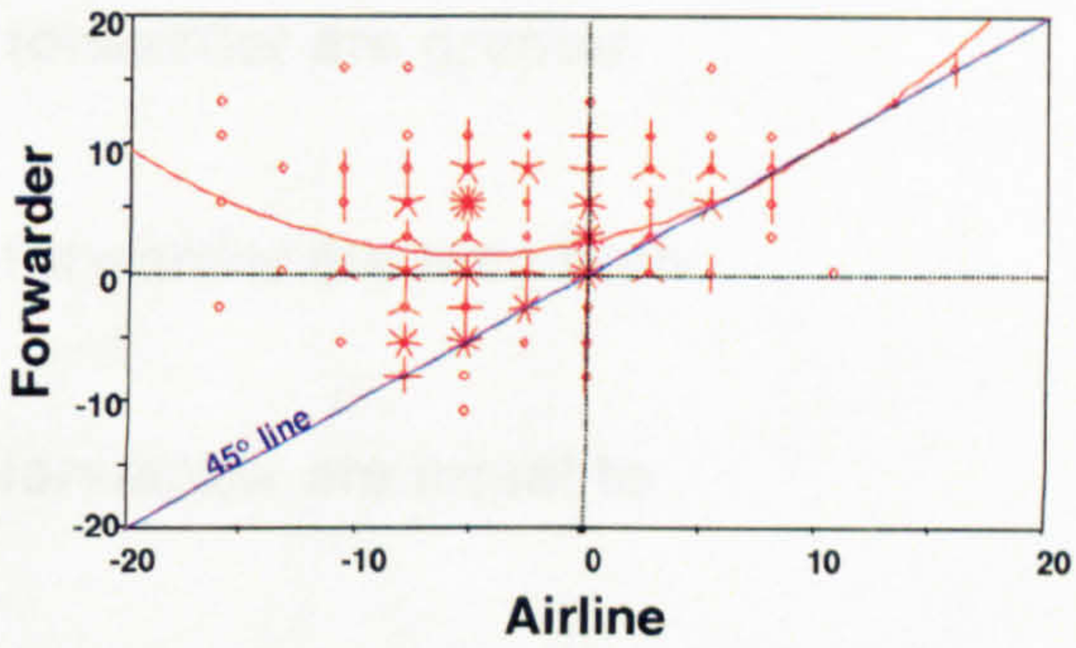
Appendix M

Scatterplots Comparing Transaction Costs (based on the summed meta-variables)

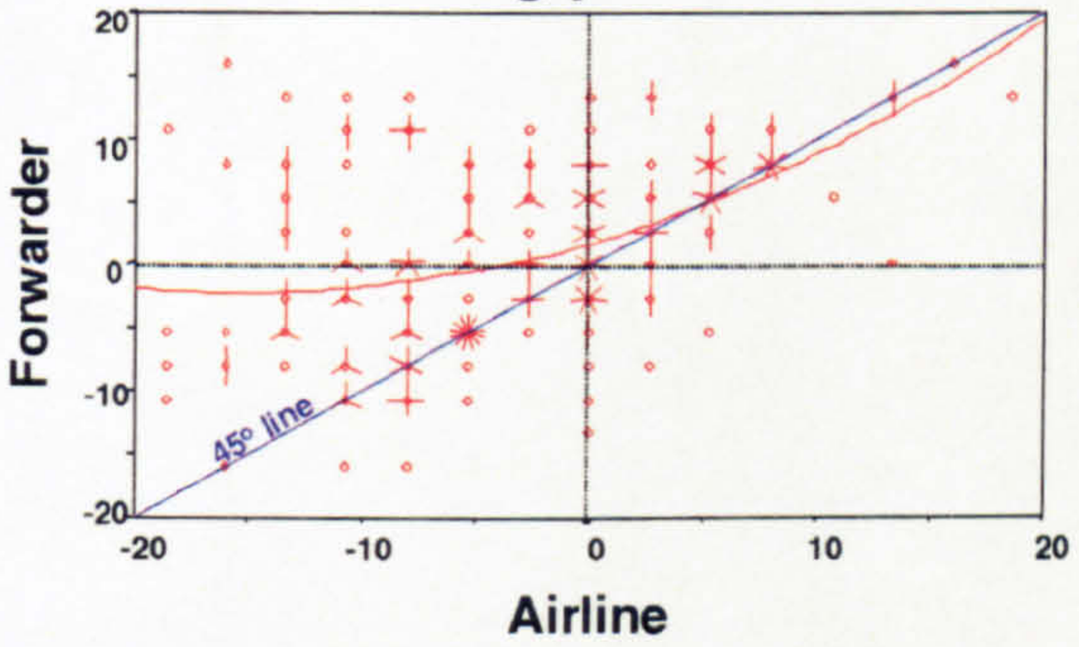
Searching for a vendor



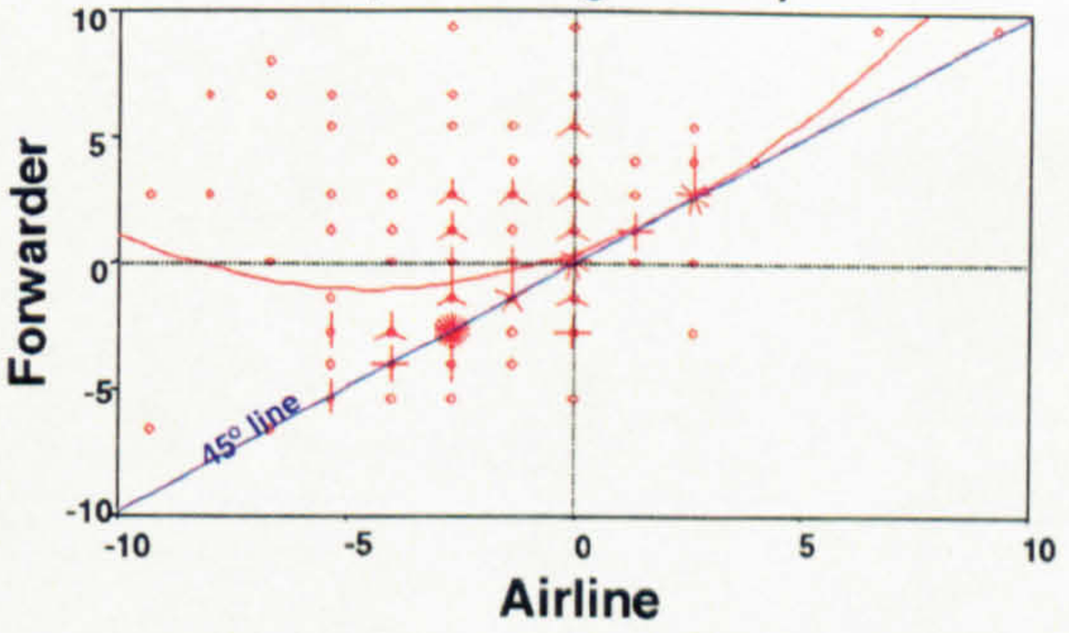
Developing a relationship with a vendor



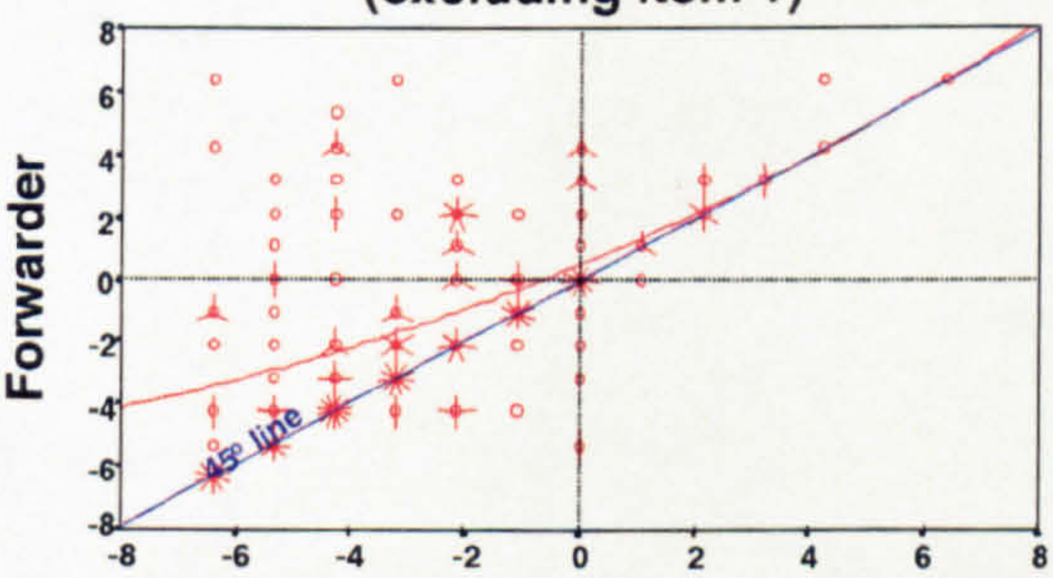
Monitoring performance



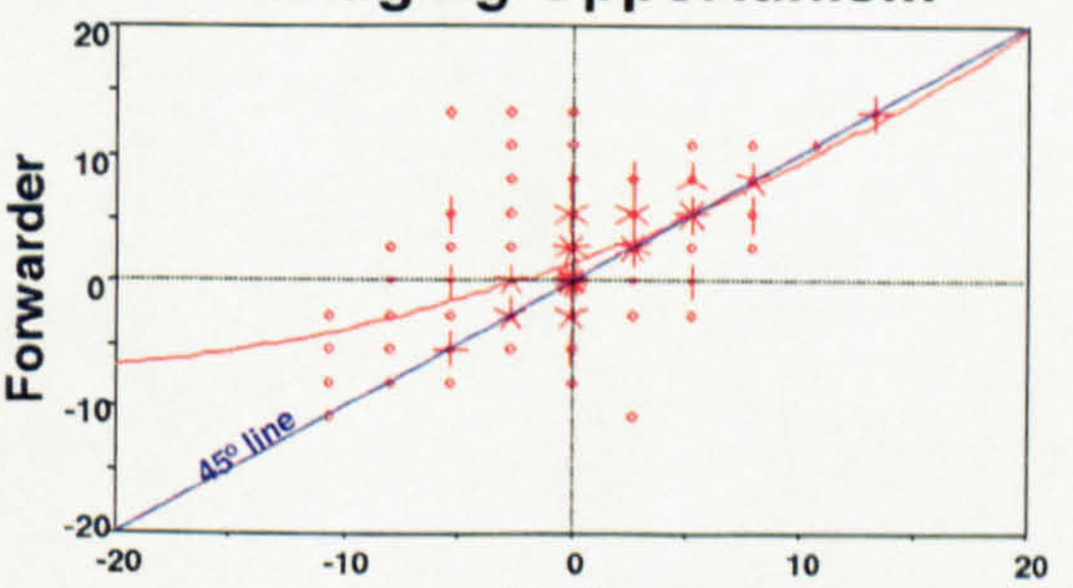
Handling problems (including Item 1)



Handling problems (excluding Item 1)



Managing Opportunism



Appendix N (1)

Non-parametric tests

Ranks

Negative ranks:	**The TCs of searching for a forwarder are greater than those for an airline.**
Positive ranks:	**The TCs of searching for a forwarder are less than those for an airline.**
Ties:	**The TCs of searching for a forwarder are equal to those for an airline.**

TC Item		Rank	N	Mean Rank	Sum of Ranks
Search Items (based on forwarder score minus airline score)	Item 1	Negative ranks	12	44.46	533.50
		Positive ranks	128	72.94	9336.50
		Ties	36		
		Total	176		
	Item 2	Negative ranks	32	40.59	1299.00
		Positive ranks	53	44.45	2356.00
		Ties	91		
		Total	176		
	Item 3	Negative ranks	13	29.27	380.50
		Positive ranks	92	56.35	5184.50
		Ties	71		
		Total	176		
	Item 4	Negative ranks	25	41.76	1044.00
		Positive ranks	71	50.87	3612.00
		Ties	80		
		Total	176		
Development Items (based on forwarder score minus airline score)	Item 1	Negative ranks	20	41.65	833.00
		Positive ranks	97	62.58	6070.00
		Ties	59		
		Total	176		
	Item 2	Negative ranks	23	42.39	975.00
		Positive ranks	92	61.90	5695.00
		Ties	61		
		Total	176		
	Item 3	Negative ranks	13	37.04	481.50
		Positive ranks	110	64.95	7144.50
		Ties	53		
		Total	176		
	Item 4	Negative ranks	25	41.02	1025.50
		Positive ranks	82	57.96	4752.50
		Ties	69		
		Total	176		
	Item 5	Negative ranks	21	33.05	694.00
		Positive ranks	84	57.99	4871.00
		Ties	71		
		Total	176		

TC Item		Rank	N	Mean Rank	Sum of Ranks
Monitor Items (based on forwarder score minus airline score)	Item 1	Negative ranks	17	31.38	533.50
		Positive ranks	95	60.99	5794.50
		Ties	64		
		Total	176		
	Item 2	Negative ranks	27	40.65	1097.50
		Positive ranks	79	57.89	4573.50
		Ties	70		
		Total	176		
	Item 3	Negative ranks	28	43.18	1209.00
		Positive ranks	78	57.21	4462.00
		Ties	70		
		Total	176		
	Item 4	Negative ranks	27	40.48	1093.00
		Positive ranks	56	42.73	2393.00
		Ties	93		
		Total	176		
	Item 5	Negative ranks	25	40.82	1020.50
		Positive ranks	68	49.27	3350.50
		Ties	83		
		Total	176		
	Item 6	Negative ranks	29	37.36	1083.50
		Positive ranks	71	55.87	3966.50
		Ties	76		
		Total	176		
Problem Items (based on forwarder score minus airline score)	Item 1	Negative ranks	24	31.60	758.50
		Positive ranks	52	41.68	2167.50
		Ties	100		
		Total	176		
	Item 2	Negative ranks	14	28.64	401.00
		Positive ranks	73	46.95	3427.00
		Ties	89		
		Total	176		
	Item 3	Negative ranks	16	27.66	442.50
		Positive ranks	54	37.82	2042.50
		Ties	106		
		Total	176		

TC Item		Rank	N	Mean Rank	Sum of Ranks
Opportunism Items (based on forwarder score minus airline score)	Item 1	Negative ranks	24	32.04	769.00
		Positive ranks	49	39.43	1932.00
		Ties	103		
		Total	176		
	Item 2	Negative ranks	34	42.79	1455.00
		Positive ranks	55	46.36	2550.00
		Ties	87		
		Total	176		
	Item 3	Negative ranks	25	45.14	1128.50
		Positive ranks	62	43.54	2699.50
		Ties	89		
		Total	176		
	Item 4	Negative ranks	20	26.05	521.00
		Positive ranks	50	39.28	1964.00
		Ties	106		
		Total	176		

Appendix N (2)

Test Statistics – Wilcoxon Signed Ranks Test and Sign Test (based on negative ranks)

TC Item		Test & Test Statistics			
		Wilcoxon Signed Ranks Test		Sign Test	
		Z	Asymp. Sig. (2-tailed)	Z	Asymp. Sig. (2-tailed)
Search Items	Item 1	-9.207	.000	-9.719	.000
	Item 2	-2.379	.017	-2.169	*.030*
	Item 3	-7.750	.000	-7.612	.000
	Item 4	-4.754	.000	-4.593	.000
Development Items	Item 1	-7.206	.000	-7.026	.000
	Item 2	-6.710	.000	-6.341	.000
	Item 3	-8.460	.000	-8.656	.000
	Item 4	-5.894	.000	-5.414	.000
	Item 5	-6.734	.000	-6.051	.000
Monitor Items	Item 1	-7.696	.000	-7.276	.000
	Item 2	-5.542	.000	-4.954	.000
	Item 3	-5.199	.000	-4.759	.000
	Item 4	-2.989	.003	-3.073	.002
	Item 5	-4.518	.000	-4.355	.000
	Item 6	-5.008	.000	-4.100	.000
Problem Items	Item 1	-3.731	.000	-3.097	.002
	Item 2	-6.540	.000	-6.218	.000
	Item 3	-4.736	.000	-4.422	.000
Opportunism Items	Item 1	-3.246	.001	-2.809	.005
	Item 2	-2.280	*.023*	-2.120	*.034*
	Item 3	-3.367	.001	-3.860	.000
	Item 4	-4.322	.000	-3.466	.001

Appendix O (1)

ANOVA tests

Question 1:	**Size (in terms of number of shipments world-wide)**
Question 2:	**Importance of exporting (in terms of percentage of organisation's total sales revenue)**
Question 3:	**Trading regions**
Question 4:	**Number of consignees in most important trading region**
Question 5a:	**Dominant transportation mode**
Question 5b:	**Percentage use of ocean freight**
Question 6a:	**Direct use of airlines (Yes/No). Also the DV question.**
Question 6b:	**Percentage use of forwarders (split into 5 bands between 0% and 100%)**
Question 8:	**Percentage of freight moved by dominant carrier (split into 5 bands between 0% and 100%)**
Question 9:	**Number of forwarders with which shipper deals**
Question 10:	**Number of airlines with which shipper deals**
Question 11:	**Corporate experience in years**
Question 12a:	**Dominant trading term used**
Question 12b:	**Ranking of ex-works term**
Question 12c:	**Ranking of D-type term**

Question 1: Size		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	53.572	4	13.393	.629	.643
	Within Groups	3643.860	171	21.309		
	Total:	3697.432	175			
Sum of Development Differences	Between Groups	49.895	4	12.474	.264	.901
	Within Groups	8070.014	171	47.193		
	Total:	8119.909	175			
Sum of Monitor Differences	Between Groups	110.670	4	27.667	.481	.750
	Within Groups	9831.825	171	57.496		
	Total:	9942.494	175			
Sum of Problem Differences	Between Groups	47.240	4	11.810	1.061	.378
	Within Groups	1903.572	171	11.132		
	Total:	1950.813	175			
Sum of Opportunism Differences	Between Groups	104.992	4	26.248	1.680	.157
	Within Groups	2671.002	171	15.620		
	Total:	2775.994	175			

Question 2: Export Importance		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	77.066	4	19.266	.869	.484
	Within Groups	3459.493	156	22.176		
	Total:	3536.559	160			
Sum of Development Differences	Between Groups	160.723	4	40.181	.817	.516
	Within Groups	7675.836	156	49.204		
	Total:	7836.559	160			
Sum of Monitor Differences	Between Groups	331.736	4	82.934	1.406	.234
	Within Groups	9200.760	156	58.979		
	Total:	9532.497	160			
Sum of Problem Differences	Between Groups	45.429	4	11.357	1.003	.408
	Within Groups	1766.373	156	11.323		
	Total:	1811.801	160			
Sum of Opportunism Differences	Between Groups	43.173	4	10.793	.687	.602
	Within Groups	2452.255	156	15.720		
	Total:	2495.429	160			

Question 3: Trading Regions		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	99.213	5	19.843	.924	.467
	Within Groups	3564.106	166	21.471		
	Total:	3663.320	171			
Sum of Development Differences	Between Groups	374.064	5	74.813	1.629	.155
	Within Groups	7622.913	166	45.921		
	Total:	7996.977	171			
Sum of Monitor Differences	Between Groups	124.081	5	24.816	.424	.831
	Within Groups	9709.332	166	58.490		
	Total:	9833.413	171			
Sum of Problem Differences	Between Groups	24.413	5	4.883	.424	.832
	Within Groups	1912.954	166	11.524		
	Total:	1937.366	171			
Sum of Opportunism Differences	Between Groups	38.807	5	7.761	.475	.795
	Within Groups	2712.193	166	16.339		
	Total:	2751.000	171			

Question 4: Number of Consignees		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	46.245	5	9.249	.434	.825
	Within Groups	3583.663	168	21.331		
	Total:	3629.908	173			
Sum of Development Differences	Between Groups	107.246	5	21.449	.451	.812
	Within Groups	7982.248	168	47.513		
	Total:	8089.494	173			
Sum of Monitor Differences	Between Groups	206.230	5	41.246	.725	.606
	Within Groups	9558.460	168	56.896		
	Total:	9764.690	173			
Sum of Problem Differences	Between Groups	44.033	5	8.807	.779	.566
	Within Groups	1898.708	168	11.302		
	Total:	1898.708	168	11.302		
Sum of Opportunism Differences	Between Groups	61.048	5	12.210	.808	.545
	Within Groups	2538.171	168	15.108		
	Total:	2599.218	173			

Question 5a: Dominant Transportation Mode		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	51.595	5	10.319	.479	.792
	Within Groups	3642.040	169	21.551		
	Total:	3693.634	174			
Sum of Development Differences	Between Groups	77.468	5	15.494	.326	.897
	Within Groups	8040.246	169	47.575		
	Total:	8117.714	174			
Sum of Monitor Differences	Between Groups	142.034	5	28.407	.491	.783
	Within Groups	9777.714	169	57.856		
	Total:	9919.749	174			
Sum of Problem Differences	Between Groups	41.386	5	8.277	.734	.599
	Within Groups	1906.122	169	11.279		
	Total:	1947.509	174			
Sum of Opportunism Differences	Between Groups	77.259	5	15.452	.968	.439
	Within Groups	2696.455	169	15.955		
	Total:	2773.714	174			

Question 5b: Percentage Use of Ocean Freight		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	137.108	4	34.277	1.651	.164
	Within Groups	3507.886	169	20.757		
	Total:	3644.994	173			
Sum of Development Differences	Between Groups	82.859	4	20.715	.437	.781
	Within Groups	8004.273	169	47.363		
	Total:	8087.132	173			
Sum of Monitor Differences	Between Groups	80.457	4	20.114	.351	.843
	Within Groups	9689.175	169	57.332		
	Total:	9769.632	173			
Sum of Problem Differences	Between Groups	49.283	4	12.321	1.105	.356
	Within Groups	1883.527	169	11.145		
	Total:	1932.810	173			
Sum of Opportunism Differences	Between Groups	51.488	4	12.872	.833	.506
	Within Groups	2611.644	169	15.454		
	Total:	2663.132	173			

Question 6a: Direct Use of Airlines (Yes/No - DV)		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	56.991	1	56.991	2.724	.101
	Within Groups	3640.440	174	20.922		
	Total:	3697.432	175			
Sum of Development Differences	Between Groups	130.712	1	130.712	2.847	*.093*
	Within Groups	7989.197	174	45.915		
	Total:	8119.909	175			
Sum of Monitor Differences	Between Groups	73.762	1	73.762	1.301	.256
	Within Groups	9868.732	174	56.717		
	Total:	9942.494	175			
Sum of Problem Differences	Between Groups	6.428	1	6.428	.575	.449
	Within Groups	1944.385	174	11.175		
	Total:	1950.812	175			
Sum of Opportunism Differences	Between Groups	10.926	1	10.926	.688	.408
	Within Groups	2765.069	174	15.891		
	Total:	2775.994	175			

Question 6b: Percentage Use of Forwarders		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	199.791	4	49.948	2.442	*.049*
	Within Groups	3497.641	171	20.454		
	Total:	3697.432	175			
Sum of Development Differences	Between Groups	167.533	4	41.883	.901	.465
	Within Groups	7952.376	171	46.505		
	Total:	8119.909	175			
Sum of Monitor Differences	Between Groups	287.418	4	71.855	1.273	.283
	Within Groups	9655.076	171	56.462		
	Total:	9942.494	175 ÿ			
Sum of Problem Differences	Between Groups	55.448	4	13.862	1.251	.291
	Within Groups	1895.365	171	11.084		
	Total:	1950.812	175			
Sum of Opportunism Differences	Between Groups	5.478	4	1.370	.085	.987
	Within Groups	2770.516	171	16.202		
	Total:	2775.994	175			

Question 8: Percentage by Dominant Carrier		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	98.095	5	19.619	.927	.465
	Within Groups	3599.337	170	21.173		
	Total:	3697.432	175			
Sum of Development Differences	Between Groups	165.482	5	33.096	.707	.619
	Within Groups	7954.427	170	46.791		
	Total:	8119.909	175			
Sum of Monitor Differences	Between Groups	263.313	5	52.663	.925	.466
	Within Groups	9679.181	170	56.936		
	Total:	9942.494	175			
Sum of Problem Differences	Between Groups	20.678	5	4.136	.364	.872
	Within Groups	1930.135	170	11.354		
	Total:	1950.812	175			
Sum of Opportunism Differences	Between Groups	35.843	5	7.169	.445	.817
	Within Groups	2740.151	170	16.119		
	Total:	2775.994	175			

Question 9: Number of Forwarders		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	72.963	4	18.241	.861	.489
	Within Groups	3624.469	171	21.196		
	Total:	3697.432	175			
Sum of Development Differences	Between Groups	23.243	4	5.811	.123	.974
	Within Groups	8096.667	171	47.349		
	Total:	8119.909	175			
Sum of Monitor Differences	Between Groups	612.411	4	153.103	2.806	*.027*
	Within Groups	9330.084	171	54.562		
	Total:	9942.494	175			
Sum of Problem Differences	Between Groups	55.223	4	13.806	1.245	.294
	Within Groups	1895.590	171	11.085		
	Total:	1950.812	175			
Sum of Opportunism Differences	Between Groups	42.180	4	10.545	.660	.621
	Within Groups	2733.814	171	15.987		
	Total:	2775.994	175			

Question 10: Number of Airlines		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	109.110	4	27.277	1.300	.272
	Within Groups	3588.322	171	20.984		
	Total:	3697.432	175			
Sum of Development Differences	Between Groups	357.743	4	89.436	1.970	.101
	Within Groups	7762.166	171	45.393		
	Total:	8119.909	175			
Sum of Monitor Differences	Between Groups	154.153	4	38.538	.673	.611
	Within Groups	9788.341	171	57.242		
	Total:	9942.494	175			
Sum of Problem Differences	Between Groups	77.447	4	19.362	1.767	.138
	Within Groups	1873.365	171	10.955		
	Total:	1950.813	175			
Sum of Opportunism Differences	Between Groups	19.987	4	4.997	.310	.871
	Within Groups	2756.008	171	16.117		
	Total:	2775.994	175			

Question 11: Corporate Experience		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	16.549	3	5.516	.255	.857
	Within Groups	3672.325	170	21.602		
	Total:	3688.874	173			
Sum of Development Differences	Between Groups	29.715	3	9.905	.214	.887
	Within Groups	7876.492	170	46.332		
	Total:	7906.207	173			
Sum of Monitor Differences	Between Groups	66.060	3	22.020	.398	.755
	Within Groups	9403.969	170	55.317		
	Total:	9470.029	173			
Sum of Problem Differences	Between Groups	1.138	3	.379	.034	.992
	Within Groups	1922.977	170	11.312		
	Total:	1924.115	173			
Sum of Opportunism Differences	Between Groups	51.094	3	17.031	1.071	.363
	Within Groups	2704.199	170	15.907		
	Total:	2755.293	173			

Question 12a: Dominant Trading Term		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	46.408	4	11.602	.537	.709
	Within Groups	3628.921	168	21.601		
	Total:	3675.329	172			
Sum of Development Differences	Between Groups	172.364	4	43.091	.915	.457
	Within Groups	7914.711	168	47.111		
	Total:	8087.075	172			
Sum of Monitor Differences	Between Groups	132.450	4	33.112	.572	.684
	Within Groups	9733.689	168	57.939		
	Total:	9866.139	172			
Sum of Problem Differences	Between Groups	25.543	4	6.386	.559	.693
	Within Groups	1920.595	168	11.432		
	Total:	1946.139	172			
Sum of Opportunism Differences	Between Groups	141.971	4	35.493	2.264	*.064*
	Within Groups	2633.266	168	15.674		
	Total:	2775.237	172			

Question 12b: Ranking of Ex-Works Terms		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	95.009	4	23.752	1.127	.345
	Within Groups	3602.423	171	21.067		
	Total:	3697.432	175			
Sum of Development Differences	Between Groups	123.530	4	30.882	.660	.620
	Within Groups	7996.379	171	46.762		
	Total:	8119.909	175			
Sum of Monitor Differences	Between Groups	87.225	4	21.806	.378	.824
	Within Groups	9855.269	171	57.633		
	Total:	9942.494	175			
Sum of Problem Differences	Between Groups	45.215	4	11.304	1.014	.402
	Within Groups	1905.598	171	11.144		
	Total:	1950.812	175			
Sum of Opportunism Differences	Between Groups	61.636	4	15.409	.971	.425
	Within Groups	2714.358	171	15.873		
	Total:	2775.994	175			

Question 12c: Ranking of D-Type Terms		Sum of Squares	df	Mean Square	F	Sig.
Sum of Search Differences	Between Groups	89.070	4	22.268	1.055	.380
	Within Groups	3608.362	171	21.102		
	Total:	3697.432	175			
Sum of Development Differences	Between Groups	27.457	4	6.864	.145	.965
	Within Groups	8092.453	171	47.324		
	Total:	8119.909	175			
Sum of Monitor Differences	Between Groups	706.379	4	176.595	3.270	*.013*
	Within Groups	9236.115	171	54.012		
	Total:	9942.494	175			
Sum of Problem Differences	Between Groups	43.376	4	10.844	.972	.424
	Within Groups	1907.436	171	11.155		
	Total:	1950.813	175			
Sum of Opportunism Differences	Between Groups	60.352	4	15.088	.950	.437
	Within Groups	2715.642	171	15.881		
	Total:	2775.994	175			

Appendix P (1)

Post Hoc Tests: Sum of search costs on use of forwarders

Scheffe, LSD, Ryan-Einot-Gabriel-Welsch F,and Games-Howell tests

Post Hoc Test	(I) Percentage Use of Forwarders	(J) Percentage Use of Forwarders	Mean Difference (I – J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Scheffe	0% to 20%	21% to 40%	.5667	1.752	.999	-4.8881	6.0214
		41% to 60%	-3.2250	1.489	.324	-7.8607	1.4107
		61% to 80%	-1.6686	1.402	.841	-6.0342	2.6970
		over 80%	-.5158	1.260	.997	-4.4406	3.4090
	21% to 40%	0 to 20%	-.5667	1.752	.999	-6.0214	4.8881
		41% to 60%	-3.7917	1.599	.234	-8.7712	1.1878
		61% to 80%	-2.2353	1.519	.705	-6.9644	2.4938
		over 80%	-1.0824	1.389	.962	-5.4079	3.2431
	41% to 60%	0 to 20%	3.2250	1.489	.324	-1.4107	7.8607
		21% to 40%	3.7917	1.599	.234	-1.1878	8.7712
		61% to 80%	1.5564	1.206	.797	-2.1985	5.3113
		over 80%	2.7092	1.038	.151	-.5226	5.9411
	61% to 80%	0 to 20%	1.6686	1.402	.841	-2.6970	6.0342
		21% to 40%	2.2353	1.519	.705	-2.4938	6.9644
		41% to 60%	-1.5564	1.206	.797	-5.3113	2.1985
		over 80%	1.1529	.909	.807	-1.6780	3.9838
	over 80%	0 to 20%	.5158	1.260	.997	-3.4090	4.4406
		21% to 40%	1.0824	1.389	.962	-3.2431	5.4079
		41% to 60%	-2.7092	1.038	.151	-5.9411	.5226
		61% to 80%	-1.1529	.909	.807	-3.9838	1.6780

Post Hoc Test	(I) Percentage Use of Forwarders	(J) Percentage Use of Forwarders	Mean Difference (I – J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
LSD	0% to 20%	21% to 40%	.5667	1.752	.747	-2.8909	4.0242
		41% to 60%	-3.2250	1.489	.032	-6.1633	-.2867
		61% to 80%	-1.6686	1.402	.236	-4.4358	1.0985
		over 80%	-.5158	1.260	.683	-3.0035	1.9720
	21% to 40%	0 to 20%	-.5667	1.752	.747	-4.0242	2.8909
		41% to 60%	-3.7917	1.599	.019	-6.9480	-.6354
		61% to 80%	-2.2353	1.519	.143	-5.2329	.7623
		over 80%	-1.0824	1.389	.437	-3.8242	1.6593
	41% to 60%	0 to 20%	3.2250	1.489	.032	.2867	6.1633
		21% to 40%	3.7917	1.599	.019	.6354	6.9480
		61% to 80%	1.5564	1.206	.199	-.8237	3.9365
		over 80%	2.7092	1.038	.010	.6607	4.7578
	61% to 80%	0 to 20%	1.6686	1.402	.236	-1.0985	4.4358
		21% to 40%	2.2353	1.519	.143	-.7623	5.2329
		41% to 60%	-1.5564	1.206	.199	-3.9365	.8237
		over 80%	1.1529	.909	.206	-.6415	2.9473
	over 80%	0 to 20%	.5158	1.260	.683	-1.9720	3.0035
		21% to 40%	1.0824	1.389	.437	-1.6593	3.8242
		41% to 60%	-2.7092	1.038	.010	-4.7578	-.6607
		61% to 80%	-1.1529	.909	.206	-2.9473	.6415

Post Hoc Test	(I) Percentage Use of Forwarders	(J) Percentage Use of Forwarders	Mean Difference (I – J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Games-Howell	0% to 20%	21% to 40%	.5667	1.752	.996	-4.0225	5.1559
		41% to 60%	-3.2250	1.489	.183	-7.3294	.8794
		61% to 80%	-1.6686	1.402	.620	-5.0803	1.7430
		over 80%	-.5158	1.260	.988	-3.6776	2.6461
	21% to 40%	0 to 20%	-.5667	1.752	.996	-5.1559	4.0225
		41% to 60%	-3.7917	1.599	.165	-8.5386	.9553
		61% to 80%	-2.2353	1.519	.520	-6.4684	1.9978
		over 80%	-1.0824	1.389	.919	-5.1528	2.9880
	41% to 60%	0 to 20%	3.2250	1.489	.183	-.8794	7.3294
		21% to 40%	3.7917	1.599	.165	-.9553	8.5386
		61% to 80%	1.5564	1.206	.740	-2.0813	5.1940
		over 80%	2.7092	1.038	.169	-.6827	6.1012
	61% to 80%	0 to 20%	1.6686	1.402	.620	-1.7430	5.0803
		21% to 40%	2.2353	1.519	.520	-1.9978	6.4684
		41% to 60%	-1.5564	1.206	.740	-5.1940	2.0813
		over 80%	1.1529	.909	.654	-1.2203	3.5261
	over 80%	0 to 20%	.5158	1.260	.988	-2.6461	3.6776
		21% to 40%	1.0824	1.389	.919	-2.9880	5.1528
		41% to 60%	-2.7092	1.038	.169	-6.1012	.6827
		61% to 80%	-1.1529	.909	.654	-3.5261	1.2203

Test	Percentage *Use of* Forwarders	N	Subset for *Alpha = .05*	
			1	2
Scheffe	21% to 40%	12	2.5000	
	0% to 20%	15	3.0667	
	over 80%	91	3.5824	
	61% to 80%	34	4.7353	
	41% to 60%	24	6.2917	
	Sig.		.114	
Ryan-Einot-Gabriel-Welsch F	21% to 40%	12	2.5000	
	0% to 20%	15	3.0667	
	over 80%	91	3.5824	
	61% to 80%	34	4.7353	4.7353
	41% to 60%	24		6.2917
	Sig.		.397	.425

Appendix P (2)

Post Hoc Tests: Sum of monitoring costs on number of forwarders used

Scheffe, LSD, Ryan-Einot-Gabriel-Welsch F,and Games-Howell tests

Post Hoc Test	(I) Number of Air Freight Forwarders	(J) Number of Air Freight Forwarders	Mean Difference (I – J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Scheffe	Do not deal with forwarders	1	1.9600	5.428	.998	-14.9437	18.8637
		2	-1.6829	5.349	.999	-18.3406	14.9747
		3 to 5	-4.0000	5.325	.967	-20.5815	12.5815
		over 5	-1.4912	5.314	.999	-18.0398	15.0573
	One forwarder	None	-1.9600	5.428	.998	-18.8637	14.9437
		2	-3.6429	1.874	.440	-9.4800	2.1942
		3 to 5	**-5.9600**	**1.803**	**.031**	**-11.5761**	**-.3439**
		over 5	-3.4512	1.772	.437	-8.9693	2.0668
	Two forwarders	None	1.6829	5.349	.999	-14.9747	18.3406
		1	3.6429	1.874	.440	-2.1942	9.4800
		3 to 5	-2.3171	1.549	.693	-7.1421	2.5080
		over 5	.1917	1.513	1.000	-4.5188	4.9022
	Three to five forwarders	None	4.0000	5.325	.967	-12.5815	20.5815
		1	**5.9600**	**1.803**	**.031**	**.3439**	**11.5761**
		2	2.3171	1.549	.693	-2.5080	7.1421
		over 5	2.5088	1.424	.542	-1.9250	6.9426
	Over five forwarders	None	1.4912	5.314	.999	-15.0573	18.0398
		1	3.4512	1.772	.437	-2.0668	8.9693
		2	-.1917	1.513	1.000	-4.9022	4.5188
		3 to 5	-2.5088	1.424	.542	-6.9426	1.9250

Post Hoc Test	(I) Number of Air Freight Forwarders	(J) Number of Air Freight Forwarders	Mean Difference (I – J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
LSD	Do not deal with forwarders	1	1.9600	5.428	.718	-8.7546	12.6746
		2	-1.6829	5.349	.753	-12.2415	8.8756
		3 to 5	-4.0000	5.325	.454	-14.5103	6.5103
		over 5	-1.4912	5.314	.779	-11.9806	8.9982
	One forwarder	None	-1.9600	5.428	.718	-12.6746	8.7546
		2	-3.6429	1.874	.054	-7.3428	.0570
		3 to 5	-5.9600	1.803	.001	-9.5198	-2.4002
		over 5	-3.4512	1.772	.053	-6.9489	.0464
	Two forwarders	None	1.6829	5.349	.753	-8.8756	12.2415
		1	3.6429	1.874	.054	-.0570	7.3428
		3 to 5	-2.3171	1.549	.137	-5.3755	.7413
		over 5	.1917	1.513	.899	-2.7941	3.1775
	Three to five forwarders	None	4.0000	5.325	.454	-6.5103	14.5103
		1	5.9600	1.803	.001	2.4002	9.5198
		2	2.3171	1.549	.137	-.7413	5.3755
		over 5	2.5088	1.424	.080	-.3016	5.3192
	Over five forwarders	None	1.4912	5.314	.779	-8.9982	11.9806
		1	3.4512	1.772	.053	-.0464	6.9489
		2	-.1917	1.513	.899	-3.1775	2.7941
		3 to 5	-2.5088	1.424	.080	-5.3192	.3016

Post Hoc Test	(I) Number of Air Freight Forwarders	(J) Number of Air Freight Forwarders	Mean Difference (I – J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Games-Howell	Do not deal with forwarders	1	1.9600	5.428	.747	-4.0507	7.9707
		2	-1.6829	5.349	.831	-7.6162	4.2503
		3 to 5	-4.0000	5.325	.191	-10.4175	2.4175
		over 5	-1.4912	5.314	.822	-7.8257	4.8432
	One forwarder	None	-1.9600	5.428	.747	-7.9707	4.0507
		2	-3.6429	1.874	.270	-8.7196	1.4338
		3 to 5	-5.9600	1.803	.004	-10.5027	-1.4173
		over 5	-3.4512	1.772	.223	-8.0263	1.1239
	Two forwarders	None	1.6829	5.349	.831	-4.2503	7.6162
		1	3.6429	1.874	.270	-1.4338	8.7196
		3 to 5	-2.3171	1.549	.606	-6.8189	2.1848
		over 5	.1917	1.513	1.000	-4.3439	4.7273
	Three to five forwarders	None	4.0000	5.325	.191	-2.4175	10.4175
		1	5.9600	1.803	.004	1.4173	10.5027
		2	2.3171	1.549	.606	-2.1848	6.8189
		over 5	2.5088	1.424	.386	-1.3868	6.4043
	Over five forwarders	None	1.4912	5.314	.822	-4.8432	7.8257
		1	3.4512	1.772	.223	-1.1239	8.0263
		2	-.1917	1.513	1.000	-4.7273	4.3439
		3 to 5	-2.5088	1.424	.386	-6.4043	1.3868

Test	Number of Air Freight Forwarders	N	Subset for Alpha = .05	
			1	2
Scheffe	One forwarder	25	1.0400	
	Do not deal with forwarders	2	3.0000	
	Over five forwarders	57	4.4912	
	Two forwarders	41	4.6829	
	Three to five forwarders	51	7.0000	
	Sig.		.609	
Ryan-Einot-Gabriel-Welsch F	One forwarder	25	1.0400	
	Do not deal with forwarders	2	3.0000	3.0000
	Over five forwarders	57	4.4912	4.4912
	Two forwarders	41	4.6829	4.6829
	Three to five forwarders	51		7.0000
	Sig.		.208	.282